

**Exploring and integrating local angling guide knowledge for examining tourism
sustainability in the Bahamian Flats Fishing Sector**

by

Thomas Karrow

A thesis
presented to the University of Waterloo
in fulfillment of the degree of
Doctor of Philosophy
in
Geography

Waterloo, Ontario, Canada, 2020

© Thomas Karrow 2020

Examining Committee Membership

The following served on the Examining Committee for this thesis. The decision of the Examining Committee is by majority vote.

External Examiner

Dr. R. H. Lemelin

Lakehead University, Thunder Bay, Ontario
School of Outdoor Recreation, Parks and Tourism

Supervisor

Dr. Sanjay Nepal

University of Waterloo Dept. of Geography and Environmental Management.

Internal Member

Dr. Brent Doberstein

University of Waterloo Dept. of Geography and Environmental Management.

Internal-external Member

Dr. Bryan Grimwood

University of Waterloo, Dept. of Rec. and Leisure Studies

Internal-external Member

Dr. Aaron Adams

Director of Science and Conservation, Bonefish and Tarpon Trust; Senior Scientist,
Florida Atlantic University Harbor Branch Oceanographic Institute.

Other Non-Examining Committee Members

Dr. D. Armitage

University of Waterloo, Department of Environmental Resource Management

Dr. G. Hoeppe

University of Waterloo, Department of Anthropology

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required revisions, as excepted by examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Tourism globally is ranked as the world's third largest export category, and 2017 marked the eighth consecutive year of sustained growth in the sector (UNWTO, 2018). Tourism represented 10% of the global gross domestic product (GDP), 7% of the world's exports, and one in 10 jobs worldwide (UNWTO, 2018). International tourist arrivals expanded from 25 million in 1950, to 1326 million in 2017, and are projected to reach 1.8 billion arrivals by 2030 (WTTC, 2016; UNWTO, 2018). Tourism growth has surpassed the wider economy with values in excess of 3%, and these inflated rates are projected to continue (WTTC, 2016).

For remote destinations and small-island-developing-states (SIDS) common throughout the Caribbean, capitalizing on leisure tourism is vital in the absence of a significant resource base or manufacturing infrastructure, (Weaver, 2015). The Caribbean is an area dominated by SIDS where resource deficiencies and scant manufacturing opportunities frequently plague nations within the region (Hampton and Jeyacheya, 2013). As a result, Caribbean countries are particularly dependent on tourism, promoting sun, sand, and sea, resources (Gössling, 2003). Within the Caribbean is the country of The Bahamas, one of the most popular tourist destinations in the region (O'Reilly, 1993) (See Map 1). Tourism in The Bahamas is essential to the country. Concentrated largely on New Providence, enclave tourism featuring mass tourism destination resorts, casinos and cruises, provides over 60% of the Bahamian GDP, directly or indirectly employing in excess of 50% of the entire labor force (WFB, 2014). 91% of travel spending in The Bahamas is tied to leisure travel while 80.6% of that is foreign visitor spending (WTTC, 2014). The concentrated nature of Bahamian mass-

tourism, and the associated centralized work force on New Providence Island and secondarily Grand Bahama Island, has resulted in declining populations and sparse employment opportunities on all other Bahamian islands. Throughout the Bahamian Family Islands (islands in the archipelago excluding New Providence or Grand Bahama), is a small yet vital recreational angling tourism sector centered on flats fishing for bonefish (*Albula sp.*).

In the Bahamas, bonefishing reportedly generated upwards of \$169 million US in 2008 employing upwards of 80% of residents on some Family Islands, clearly illustrating its importance, and the need for sustainable management practices (Fedler, 2018).

Central to this industry are local angling guides or tourism hosts, whose experiences and expertise have received little analytical consideration to sustainable resource outcomes. Because of employment related knowledge acquisition, guides hold important industry and resource information in a data-poor region, making their involvement in management and decision-making, critical for sustainability of the industry. Through participatory research, guides (n=71) were interviewed across the Bahamas (Andros, Abaco, Bimini, Exuma and Grand Bahama), exploring three central themes/questions: 1) guide knowledge as it applies to the social and economic pillars of tourism sustainability, 2) ecological knowledge levels related to fisheries populations dynamics, habitat changes, and fishery/industry threats; and 3) the feasibility or usefulness of angling guide knowledge for sustainable resource/tourism management in The Bahamas and beyond. This study captures oral histories to better conceptualize the sustainability of the fishery, the role of guides in this tourism sector, the importance of recreational angling tourism in The Bahamas, and the level of ecological knowledge guides possess. Furthermore,

through analyzing Bahamian guides in the bonefishing industry, lessons are drawn which may be applicable to similar fisheries in other tourism-based recreational fisheries.

Acknowledgements

The list of individuals for whom I need to thank is lengthy. I would like to begin by expressing my sincere thanks to the many pioneering Bahamian guides who participated in this study. Through sharing valuable time and information, your voices, experiences and knowledge have been accumulated. It is my hope that your efforts, along with the results of this study, are used to better manage the Bahamian fishery, ensuring sustainability long into the future. Specifically, I would like to thank elder guides like Mr. Ansil Saunders, Capt. Charlie Smith, Mr. Ralph Moxie, Mr. David Pinder Sr., Mr. Maitland Lowe, Mr. O'Donald McIntosh, Mr. Nelson Leadon, Mr. Eddie Bannister, Rev. Harold Mackie, Mr. Samuel Raymond Mackie, Mr. Herman Bain, Mr. Rudolph Timer Coakley, Mr. Jeffery Ferguson, Mr. Leroy Ginton, Mr. Stanley Ginton and Mr. Stanley Forbes. I would also like to acknowledge participating guides who have since passed away, Captain Charlie Smith, Mr. Nelson Leadon, Mr. Maitland Lowe, Mr. Thomas Mackie and Perry Demeritte.

I also thank the many Bahamians, lodge owners, and related tourism companies who provided supports throughout this study, namely the North Riding Point Club, Swains Cay Lodge, Bair's Lodge and Oliver White, Deep Water Cay, and Ian Davis of Yellow Dog Flyfishing. I specifically highlight the roles of Mr. Prescott Smith, President of the Bahamas Fly Fishing Industry Association who planted the seed for this study, and to Mr. Benjamin Pratt at the Bahamas Ministry of Tourism who has provided ongoing logistical support. I am also very grateful for help from Dr. Tracey Thompson at the University of the Bahamas along with her students who provided phenomenal supports

during my research. I am forever indebted to Dr. Thompson at the University of The Bahamas', Department of Oral History and Tradition, "from Dat Time", and I hope we can continue to collaborate on this dissertation and other related work to help preserve Bahamian oral history.

None of this research would have been possible without research funding provided by The Bonefish and Tarpon Trust. Dr. Aaron Adams, Director of Science at BTT, I thank you for having the vision to recognize the importance of local knowledge in the management process, and for advocating on my behalf to secure this funding.

I must thank my supervisor, Dr. Sanjay Nepal. Sanjay, thank you for challenging me, for supporting me, and for encouraging me throughout this process, your commitment and support has been most welcome. Thanks also to Dr. Brent Doberstein, Dr. B. Grimwood, Dr. Derrick Armitage, Dr. Goetz Hoeppe, and to Dr. Aaron Adams as my committee members for your unwavering support and commitment to my success. Finally, thanks to my external examiner, Dr. H. Lemelin, whose time and expertise I value greatly.

Dedication

I dedicate this dissertation to the wonderful people of The Bahamas, people who consistently demonstrated an unparalleled level of generosity to me throughout my travels in the islands. I further dedicate this work to the amazing Bahamian bonefish guides of the past, the present, and the future. Your voices are important, and they have been heard through this work.

Table of Contents

List of Tables	xiii
List of Figures	xiv
List of Maps	xv
Acronyms	xvi
1 Introduction	1
1.1 The Bahamas	4
1.2 Purpose of Research	9
1.3 Research Questions	10
1.4 Host Perceptions	11
1.5 Theoretical and Conceptual Contributions	12
1.6 Methodological Contributions	13
1.7 Empirical Contributions	14
1.8 Practical Contributions	14
1.9 Structure of this Dissertation	15
2 Literature Review	17
2.1 Sustainable Tourism – Origins, Goals, Challenges, and Shortfalls.....	18
2.2 Tourism Merits and Challenges	22
2.3 Ecotourism as an Alternative form of Sustainable Tourism	26
2.4 Marine Ecotourism	32
2.4.1 Merits of Marine Ecotourism	35
2.5 Recreational Angling as Ecotourism	36
2.5.1 Catch and Release Angling and implication for Consumption Classification	38
2.6 Tourism and bonefishing in The Bahamas	41
2.7 Local Ecological Knowledge	44
2.7.1 Terminology Uncertainties	46
2.7.2 Local Knowledge use in Resource Management	50
2.7.3 Integration Challenges	51
2.7.4 Applying Local Knowledge	54
2.7.5 LK Challenges Beyond Terminology and Misunderstanding.....	56
2.7.6 LK in ST, Parks and Protected Areas	60
2.8 Host Perspectives on Sustainable Tourism	63
2.9 Gaps in the Literature	67
3. Methodology	69
3.1 Background	69
3.2 Research and Methodological Rational	70
3.3 Video Ethnography	74
3.4 The Bahamas and Bonefishing	78
3.4.1 Bonefish Background	81
3.4.2 Recreational Angling for Bonefish in The Bahamas	82

3.4.3 Bonefishing Tourism	83
3.4.4 The Bahamian Bonefishing Industry	85
3.4.5 Stakeholders in the Bahamian Bonefishing Tourism Industry	86
3.5 Data Collection, Research Questions, Interview Questions and Ethical Considerations	89
3.4.1 Research Questions	89
3.4.2 Primary Interview Questions	90
3.6 Study Area	98
3.6.1 Abaco Island	103
3.6.2 Andros Island	105
3.6.3 Bimini Island	107
3.6.4 Grand Bahama Island	109
3.6.5 Exuma Island	111
3.7 Data Analysis	112
3.8 Interviewees	113
4. Results-1	117
4.1 Assessing economic and social sustainability of bonefishing in The Bahamas.....	117
4.2 Guiding Experience	117
4.3 Entry to the guiding Profession	120
4.3.1 Attributes of a Good Guide	128
4.4 Significance of guiding for employment	130
4.4.1 Guiding as a career choice for young Bahamians	131
4.5 Importance of bonefishing and guiding to The Bahamas?	132
5 Results-2	141
5.1 Assessing environmental sustainability of The Bahamas bonefish industry	141
5.2 Guide Perspectives on bonefish (<i>Albula sp.</i>) population changes	141
5.2.1 Bonefish (<i>Albula sp.</i>) Population Declines	144
5.3 Perceived tarpon (<i>Megalops atlanticus</i>) population changes	147
5.3.1 Tarpon Population Decline	149
5.3.2 Tarpon Population Increase	152
5.4 Perceived permit (<i>Trachinotus falcatus</i>) population changes	153
5.4.1 Permit Declines	154
5.4.2 Challenges to Permit Population Assumptions	155
5.4.3 Permit Population Increase	158
6 Results-3	161
6.1 Threats to Bahamian Flats Fishing and the Role of Guides in Management of these Resources	161
6.1.2 Angling Pressure	163
6.1.3 Catch and release successes	165
6.1.4 Predators	166

6.1.5 Attrition and Insufficient Replacement	169
6.1.6 Development Related Threats	177
6.1.7 Poaching	182
6.1.8 Netting and Overfishing	183
6.1.9 Environmental Decline and Changes	188
6.1.10 Governmental inaction	192
6.1.11 Walk and Wade Anglers	193
6.1.12 Technology	194
6.1.13 Consultation	194
6.2 The Potential Role of Guides in Bahamian Resource Management	197
7. Summary of Results and Discussion	203
7.1 Economic and Socio-Cultural Implications	203
7.2 Environmental Implications	212
7.3 Perceived threats facing the fishery	215
7.3.1 Angling pressure related threats	215
7.3.2 Development related threats	217
7.3.3 Poaching related threats	217
7.3.4 Bonefish netting related threats	218
7.3.5 Environmental decline and change threats	218
7.4 Guide Knowledge Potentially Applied to Bahamian Resource Management.....	219
7.5 Discussion	221
8 Summary, Conclusions and Recommendations	228
8.1 Guides Knowledge and Fisheries Management in The Bahamas	231
8.2 Key Findings	233
8.3 Conclusions	237
8.4 Recommendations	239
8.5 Scholarly Contributions	241
References	243
Appendix A: Ethics Letter, Request for Participation	277
Appendix B: Ethics Letter for Consent to Participate	279
Appendix C: Ethics Acknowledgement of Participation Letter	280
Appendix D: List of Interviewees	282
Appendix E: Co-authored political ecology book chapter	285
Appendix F: Co-authored end of ST book chapter	299

List of Tables

Table 1 - Select definitions for Sustainable Tourism after Butler (2015)	22
Table 2 - Numbers of guides on focus islands according to the BFFIA membership list	98
Table 3 - Percentage of Guides Interviewed by Decade of Experience.....	115
Table 4 – Noted attributes of a good guide.....	130
Table 5 - Identified threats to the future of The Bahamas bonefishing industry.....	162

List of Figures

Figure 1 – Image of Bonefish (<i>Albula sp.</i>) the primary target species for anglers travelling to fish the flats in The Bahamas	7
Figure 2 – A travelling angler poled by a local Bahamian across shallow flats in search of bonefish	8
Figure 3 - Conceptualization of Research Themes.....	17
Figure 4 - Years of Guiding Experience of Interviewed Guides	114
Figure 5 - Reported motivations to work as a guide.....	126
Figure 6- Importance of bonefishing and guiding to The Bahamas	133
Figure 7 Guide Perspectives on bonefish (<i>Albula sp.</i>) population changes (n=71).....	142
Figure 8- Perceived tarpon (<i>Megalops atlanticus</i>) population changes.....	149
Figure 9 - Perceived permit (<i>Trachinotus falcatus</i>) population changes. (N=55).....	154

List of Maps

Map 1 - The Islands of the Bahamas – Google Earth view	5
Map 2 - The Bahamas – Geo-political boundary view	6
Map 3 - Abaco Island highlighted map	103
Map 4 - Andros Island highlighted map	105
Map 5 - Bimini Island highlighted map	107
Map 6 - Grand Bahama Island highlighted map	109
Map 7 - Exuma Island highlighted map.....	111

Acronyms

AFFGA – Abaco Fly Fishing Guides Association

AEK – Aboriginal Ecological Knowledge

AGK – Angling Guide Knowledge

AK – Aboriginal Knowledge

BBI – Bahamas Bonefishing Industry

BFFIA – Bahamas Fly Fishing Industry Association

BTT – Bonefish and Tarpon Trust

DIY – Do it Yourself (angling ventures where angling guides are not used)

FAO – Food and Agriculture Organization of the United Nations

FCF – Fisheries Conservation Foundation

FI – Family Islands – Islands in The Bahamas other than New Providence or Grand Bahama

FK – Fishers Knowledge

GDP – Gross Domestic Product

ICZM - Integrated Coastal Zone Management

IEK – Indigenous Ecological Knowledge

IK – Indigenous Knowledge

IUCN – International Union for the Conservation of Nature

LEK – Local Ecological Knowledge

LK – Local Knowledge

MPA – Marine Protected Areas

NGO – Non-Governmental Organization

SIDS – Small Island Developing States

SRM – Sustainable Resource Management

ST – Sustainable Tourism

STCW (Safety Training and Watch Keeping Certification

STM – Sustainable Tourism Management

TEK – Traditional Ecological Knowledge

TEKW – Traditional Ecological Knowledge and Wisdom

TK – Traditional Knowledge

TNC – The Nature Conservancy

UNWTO – United Nations World Tourism Organization

WFB – The World Fact Book, US Central Intelligence Agency

WCED - World Commission on Environment and Development

WTTC – World Travel & Tourism Council

WTO – World Tourism Organization

~ Zane Grey on Bonefish (*Albula spp.*), 1918 ~

“He is the wisest, shyest, wariest, strangest fish I have ever studied”. You see him; he is there perfectly still in the clear, shallow water, a creature of fish shape. Pale green and silver, but crystal like, a phantom shape, staring at you with strange black eyes; then he is gone. Vanished! Absolutely without you seeing a movement, even a faint streak! By peering keenly you may discern a little swirl in the water.”

~~~~~

## **1. Introduction**

Tourism in 2017 ranked as the world's third largest export category, and 2017 marked the eighth consecutive year of sustained growth in the sector (UNWTO, 2018). Tourism represented 10% of the global gross domestic product (GDP), 7% of the world's exports, and one in 10 jobs worldwide (UNWTO, 2018). International tourist arrivals expanded from 25 million in 1950, to 1326 million in 2017, and are projected to reach 1.8 billion arrivals by 2030 (WTTC, 2016; UNWTO, 2018). Tourism growth has surpassed the wider economy with values in excess of 3%, and these inflated rates are projected to continue (WTTC, 2016).

For remote destinations and small-island-developing-states (SIDS) common throughout the Caribbean, capitalizing on leisure tourism is vital in the absence of a significant resource base or manufacturing infrastructure, (Weaver, 2015). The Caribbean is an area dominated by SIDS where resource deficiencies and scant manufacturing opportunities frequently plague nations within the region (Hampton and Jeyacheya, 2013). Caribbean countries commonly lack sufficient resources for profitable resource extraction, and necessary infrastructure to support manufacturing (Gössling, 2003). SIDS commonly suffer from small and undereducated work forces, while island societies are fraught with social issues such as poverty, unemployment, racial and gender inequity, or lack of access to medical care, all resulting in economic and social challenges, and disparity (Carlsen, 2016). As a result, Caribbean countries are particularly dependent on tourism, promoting sun, sand, and sea, resources (Gössling, 2003). With a temperate tropical climate, the Caribbean has been a primary

destination for affluent North Americans, and geographical proximity to US markets simplifies travel (O'Reilly, 1993).

Several variables contribute to tourism growth including, an aging global population with growing disposable incomes and more vacation time, globalization, more effective marketing campaigns, greater ease of access to remote destinations, improved communications and networking, and social media and online booking. Over 50% of travel is leisure-based travel (Edgell and Swanson, 2013; UNWTO, 2016, 2018), and while growth in leisure travel is a not new phenomenon, current levels of industry expansion are noteworthy. Tourism is touted as a means to cultural preservation, to peace and prosperity, to economic growth, development, employment and environmental protection (UNWTO, 2018). For remote destinations, commonly SIDS, capitalizing on leisure tourism is vital in the absence of a significant resource base or manufacturing infrastructure, (Weaver, 2015).

With growth in travel, impacts on local populations are mixed. Tourism dependence, loss of cultural authenticity, exploitation of local populations, tourism leakages, and over development of local environments may reduce tourism-driven benefits (Cohen and Cohen, 2012; MacCannell, 1973; Wall and Matheson, 2006). Even ecotourism, defined as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" (TIES, 2015), may result in negative consequences toward local populations and environments (Fennell, 2000; Weaver and Lawton, 2007; Weaver, 2002). Growing awareness of negative tourism related impacts have prompted more responsible travel philosophy (Goodwin, 2016), and more sustainable tourism



initiatives. According to the World Tourism Organization (WTO), sustainable tourism (ST) “requires the informed participation of all relevant stakeholders, as well as strong political leadership to ensure wide participation and consensus building.” (WTO, 2004). Sustainable tourism is a continuous process of assessing tourism impacts, simultaneously introducing preventive or corrective measures as needed. ST should maintain high tourist satisfaction, which ensures positive experiences for tourists and hosts, and it should provide education through raising awareness about sustainability issues (WTO, 2004). Sustainable tourism should balance economic, societal and environmental tourism impacts, aligning with sustainable development priorities (IISD, 2017). For SIDS reliant on tourism, ST is particularly important. Marine environments and small exploitable populations may be more susceptible to negative tourism influences. Because of a lack of employment opportunities on SIDS, dependence on tourism is often high, increasing the need for sustainable tourism practices.

Sustainable Tourism is a concept with a history of identity crisis. While sustainable development fundamentals form the basis of ST, ‘sustainability’ terminology is frequently misused and overused (Butler, 1998; 1991). Sustainable development is defined as, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987:43), emerging as a product of the Brundtland Report (WCED, 1987). Sustainable development is grounded on the three pillars of sustainability, balancing the economy, society needs, and the environment. In spite of an origin in the 1980’s, sustainable development remains a contested term (Wheeler, 1993). Despite this, sustainable tourism is now widely recognized as a means through which the benefits of tourism

continue, while minimizing its negative consequences. Tourism impacts can heavily counteract potential benefits, leaving host populations with different levels of irritation (Doxey, 1975b.). “If communities perceive the cost of tourism development to be greater than the benefits, it is arguable that they may withdraw their support for tourism, threatening the future success of the sector. As a result, understanding of local residents’ perceptions or attitudes toward tourism and tourists is considered a vital ingredient of tourism planning and management.” (Sharpley, 2014:46). Sustainable tourism aims to reduce potential negative aspects of tourism while promoting tourism merits.

### **1.1 The Bahamas**

Within the Caribbean, a region dominated by SIDS reliant on tourism, is the country of The Bahamas, one of the most popular tourist destinations in the region (O’Reilly, 1993) (See Map 1 and Map 2). Tourism in The Bahamas is essential to the country. “The Bahamas has a very narrow resource base even when compared with other Caribbean countries. The land for the most part is covered with a very thin layer of soil, and only about two hundred and sixty square miles, equivalent to 5% of the total land area, are suitable for commercial agriculture.” (O’Reilly, 1993:33).

Throughout The Bahamas, there is little arable land or mineral deposits. Salt and aragonite (a pure calcium carbonate sand used in the manufacture of cement, chemical lime, steal, glass, pulp and paper, and agricultural fertilizers) are extracted, but quantities are insufficient for large-scale production, or widespread employment. While The Bahamas are an important international financial center and tax haven, tourism is

the primary commodity (O'Reilly, 1993).

Concentrated largely on New Providence, enclave tourism featuring mass tourism destination resorts, casinos and cruises, provides over 60% of the Bahamian GDP, directly or indirectly employing in excess of 50% of the entire labor force (WFB, 2014). 91% of travel spending in The Bahamas is tied to leisure travel while 80.6% of that is foreign visitor spending (WTTC, 2014). The concentrated nature of Bahamian tourism, and the associated centralized work force on New Providence Island and secondarily Grand Bahama Island, has resulted in declining populations and sparse employment opportunities on all other Bahamian islands.

Map 1 – The Commonwealth of The Bahamas (Turrell, 2016).



Map 2 –The Islands of The Bahamas – Google Earth, 2019



Historically, agriculture and commercial angling provided employment on Bahamian Family Islands (Bahamian islands beyond New Providence or Grand Bahama Island), but both industries now suffer the consequences of over extraction, mismanagement and insufficient regulation (Craton, 1986). In light of a focused mass tourism industry in Nassau, a lack of economic opportunities and declining populations on remote Bahamian islands, tourism on Family Islands has evolved catering to an alternative tourism market. Eadington and Smith (1992, p. 3), articulate alternative tourism as “forms of tourism that are consistent with natural, social, and community values, that allow both hosts and guests to enjoy positive and worthwhile interaction and shared experiences”. While nature-based activities like birding, hiking, kayaking and diving (all considered alternative tourism activities) are economically important to Bahamian Family Islands, The Bahamas’ recreational flats fishery has become an

economic necessity with respect to employment and revenue generation. Bonefish (*Albula sp.*) are the primary target species sought by travelling anglers, and a majority of anglers rely on local Bahamian angling guides who pole them across shallow marine flats in uniquely designed “flats boats” in search of these fish (See Figure 1 and 2).

Figure 1 – Image of Bonefish (*Albula sp.*) the primary target species for anglers travelling to fish the flats in The Bahamas. Image courtesy of Dan Decibel, Andros Island, 2017



Figure 2 – A travelling angler is typically poled by a local Bahamian guide across shallow flats as they search for bonefish. Image courtesy of Tom Karrow, Andros, 2019



In 2008 the Bahamian bonefishing sector generated US \$141 million (Fedler, 2010). This sum is comprised of US \$70 million in direct spending, and a further US \$71 million in value added impacts such as transportation. According to Fedler (2010), angling visitors spend 27% more than the average visitor spends, and 17% more per visitor night significantly contributing to small Family Island communities where flats angling takes place (Fedler, 2010). Fedler (2010) also concluded that upwards of 80% of residents on some family islands are employed either directly or indirectly through flats fishing. A more recent analysis of Bahamian flats fishing by The Food and Agriculture Association of the United Nations (FAO, 2016), revealed the sector contributes in excess of US \$183 million to the overall GDP of The Bahamas, with an estimated total of US \$292 million derived in output sales. Fedler (2019) recently re-evaluated the Bahamian bonefishing industry, once again conducting an economic



impact study of this fishery; he concluded the sector now generates over US \$169 million. Variability in sampling methodology and available data from the government of The Bahamas resulted in significant discrepancies between these studies. Notwithstanding this, when considering the lower of the two more recent studies, (Fedler, 2019), the economic impact is still highly significant.

## **1.2 Purpose of Research**

In light of the economic significance of the Bahamian flats fishery to Family Island communities throughout the archipelago, sustainability of the sector is crucial. This dissertation examines flats fishing tourism in The Bahamas. The sustainability of flats fishing in The Bahamian is examined, which in turn has consequences for similar recreational flats angling fisheries beyond The Bahamas (e.g. Florida Keys, Belize, Cuba, Mexico, Seychelles). Sustainability of the Bahamian fishery is assessed through consultation with angling guides, the tourism hosts. Through semi-formal interviews with Bahamian angling guides, an ethnographic examination of the central actors (guides) and some key stakeholders provides insight into sustainability of recreational flats angling. Absence of formal studies examining economic, social or environmental impacts of this fishery, rationalize contributions made by this dissertation, and may provide strategies for analysis of analogous fisheries or other wildlife-based tourism destinations. Moreover, in examining this tourism industry from the perspective of guides (the hosts), gaps in host-guest tourism literature are narrowed (see chapter 2, where related literature is reviewed). A grounded theory approach utilizing an inductive

methodology is employed to generate conceptual theories about this form of tourism (Glaser and Strauss, 1967; Strauss and Corbin, 1990).

By examining flats fishing in The Bahamas through a sustainable tourism lens, consideration of the pillars of sustainability (economy, society and environment) is necessary. Three primary research questions align with these pillars of sustainability, and guide this study (See chapter 3, on methodology for additional information on research questions). Question 1 and its sub-questions examine the economic and social impacts of flats angling on angling guides, and local communities. Question 2 and its sub-questions focus on the flats fishing environment, fisheries population dynamics, observed and perceived changes, and industry threats. Finally, question 3 focuses on the overall assessment of the industry from the guides' perspectives, examining how guide participation as leading stakeholders in the sector could help contribute to ensure industry sustainability.

### **1.3 Research Questions**

Three central research questions guide this study:

1. What does guiding mean, what motivates guides to be a guide and what is their view of economic significance of the job?

The following sub-questions were examined to offer detailed insights into the importance of bonefishing tourism to local guides.

- 1.1- What influences encourage guides to enter the profession and what merits (if any) are deemed through guiding that make it a worthwhile employment opportunity in Bahamian communities? Guide motivation
- 1.2- How important is guiding in The Bahamas, and how has the industry shaped Family Island (FI) communities? Role of guiding for FI communities – economic significance
- 1.3- How do guides measure their own success as a guide?



2. How do Bahamian angling guides view their resources (e.g. fisheries habitats, population dynamics, conservation strategies, etc.).

The following sub-questions were examined to address the main question:

- 2.1 - How have contemporary Bonefish (*Albula vulpes*), Tarpon (*Megalops atlanticus*) and Permit (*Trachinotus falcatus*) population dynamics in The Bahamas, (specifically Bimini, Grand Bahama, Abaco, Exuma and Andros), changed over time from the perspective of guides?
- 2.2 - What changes (ecological or economic, as defined by guides) are affecting the fishery, the industry and local communities?
- 2.3 – Are identified changes common throughout the study area or are there local variations?

3. How can guide's understanding of contemporary changes in the recreational angling industry inform sustainable resource management policies in The Bahamas?

#### **1.4 Host Perceptions**

While sustainability of flats fishing tourism in The Bahamas is the focus of this dissertation, host perceptions of the industry and local ecosystems, are the sources of information for assessing sustainability. According to Stronza (2001), tourism studies fundamentally examine either tourism origins, or tourism impacts; the former focused on tourists and the latter on locals/hosts/residents. Studies focusing on host-tourist social interactions and perceptions are extensive, originating in the late 1970's with seminal works like *The Holiday Makers* (Krippendorf, 1987). Despite a considerable volume of literature, a recent review of related academic works by Sharpley (2014) notes several glaring issues within the body of research, namely: a narrow case-study base, heavy reliance on quantitative methodology and analysis (also noted by Easterling, 2004 and Deery et al., 2012), a focus on perceptions rather than responses, a

geographical concentration of existing research efforts (focussed on North America), an emphasis on studies in developed countries, a concentration on domestic tourism cases (again in North America), and a tendency for studies to remain purely theoretical. To that end, a number of studies examining host attitudes towards tourism have attempted to employ theoretical models including: equity theory (Pearce, et al., 1991), gross machine theory (Martin et al., 1998), life cycle theory (Butler, 1980), power theory (Kayat, 2002), and social exchange theory (Ap, 1992; Easterling, 2004), while Carlsen (2016) suggests a soft systems modelling approach is more affective for tourism given the multi-disciplinary nature of the field. Still, a majority of studies draw upon social exchange theory and social representations theory, “even where they (theoretical frameworks) have been utilized, the contribution of these to explaining or understanding residences’ perceptions remains unclear.” (Sharpley, 2014:45). Contrary to these aforementioned methodological limitations, this dissertation expands the current case study base focussing on perceptions *and* responses, it exclusively employs a qualitative approach to analysing tourism sustainability, and it deviates from the largely North American-centric scope. As such, the empirical, ethnographic/anthropological nature of this study, adds to, and fills gaps in the current tourism literature on hosts and their perceptions.

### **1.5 Theoretical and Conceptual Contributions**

This study advances conceptualization of Bahamas bonefishing. It examines the role of guides, the level of local knowledge that guides hold as it pertains to fisheries population dynamics and habitat changes, and it addresses the viability of guide knowledge use in sustainable tourism management (STM) and sustainable resource

management (SRM). In assessing the practicality of this approach to SRM and STM in The Bahamas, this study draws upon, and contributes to, scholarly literature that examines LK as a means to enhance SRM and STM, with a concentrated focus on recreational angling. This study reinforces literature findings, demonstrating the importance of incorporating locals into decision-making processes. Results illustrate how local knowledge is comprehensive, is generated through trial and error much like formal science, is passed on generationally, and thus how it provides good historical assessments of resources in data-poor regions. At a broader scale, examinations of other wildlife-base tourism venues should always incorporate consultation with tourism hosts; consulting and accessing local knowledge enhances the likelihood for sustainability of tourism operations.

## **1.6 Methodological Contributions**

This study is premised on participatory research conducted through ethnographic interviews (oral histories), along with analysis of pertinent archival and policy documents, and it demonstrates how related studies can build from conclusions drawn. Angling guide knowledge (AGK), provides the basis for a methodological experimental analysis, lending to similar approaches for analogous fisheries elsewhere, and an assessment of viability and reliability of this knowledge source is provided. Analysis of recreational angling tourism venues from the perspectives of only the hosts (guides) is absent in the literature making this study unique. This study uses both a novel approach, and it evaluates the efficacy of this approach. Recommendations on the

practicality of this methodology are provided, along with provisions for development of a model for use in similar tourism industries.

### **1.7 Empirical Contributions**

Focusing on AGK use for SRM and STM in the Bahamian islands of Bimini, Grand Bahama, Abaco, Exuma and Andros, this study contributes to the empirical record of ways to collaborate with professional angling guides to enhance management of the industry through encouraging participation and knowledge sharing in data poor regions. This approach has not been taken for studies of Bahamian or other recreational angling tourism operations.

### **1.8 Practical Contributions**

Results of this study may help improve management of Bahamas bonefishing through participation, collaboration and education. Results may bolster current understandings about bonefish, tarpon, and permit ecology, and deliver recommendations on inter and intra-island stresses impacting local fisheries. It may further illustrate the importance of Bahamian bonefishing tourism, and the role guides fill. Furthermore, this study assesses the viability of AGK use as a tool for SRM and STM both in The Bahamas, and potentially elsewhere. Governing bodies including, levels of government (tourism and environment), and NGO's (like Bonefish and Tarpon Trust, The Bahamas National Trust, or The Nature Conservancy), may use information drawn from this study to guide decision-making and foster co-management

opportunities, ultimately resulting in greater appreciation for guides, the tourism sector, and the use of LK as a tool for SRM and STM.

## **1.9 Structure of this Dissertation**

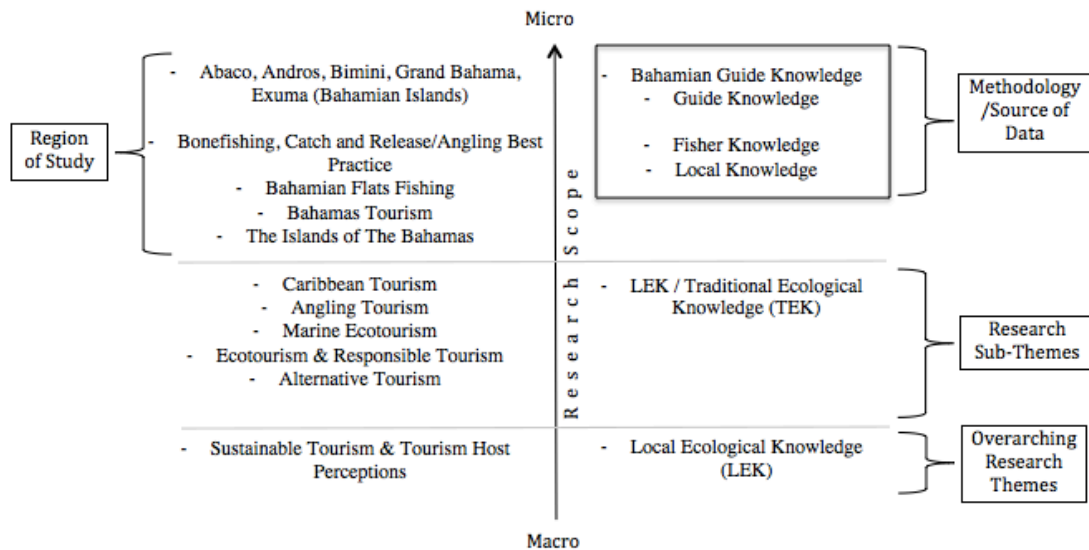
This dissertation is organized into eight chapters. Chapter 1 provides an introduction to the study while chapter 2 examines current literature, highlighting research gaps that are addressed through this research. The interdisciplinary, multi-faceted nature of this dissertation requires an examination of a multitude of disciplines including: sustainable development and sustainable tourism, alternative tourism forms like ecotourism, the host/guest tourism literature, as well as challenges associated with local knowledge use as a resource management tool. Chapter 3 focuses on the methodological approaches employed in this study. Study area details are provided, along with sampling methods and analytic techniques. Chapter 4 provides results for leading question #1, and its sub-questions - What does guiding mean to Bahamians in marginalized Family Island (FI) Communities, what motivates guides to become a guide, and what is their view of the economic significance of the profession? Chapter 5 provides the analysis of results for leading question #2, and its sub-questions – How do Bahamian angling guides view their resources (e.g. fisheries habitats, population dynamics, conservation strategies, etc.). Chapter 6 delivers results on the analysis for leading question #3, and its sub-questions - How can guide's understanding of contemporary changes in the recreational angling industry inform sustainable resource management policies in the Bahamas? Chapter 7 is a discussion of results from chapters

4 through 6, and chapter 8 provides a summary of results, offers recommendations, and the study culminates with conclusions and recommendations for extended study

## 2. Literature Review

This dissertation examines recreational flats fishing in The Bahamas from the perspective of local angling guides, the tourism hosts. Local angling guide/ecological knowledge is accessed and used to assess sustainability of this tourism-driven fishery. Accordingly, numerous literature themes require examination to frame this research, and to identify gaps that are filled by this study. (See Figure 3)

Figure 3 – Conceptualization of Literature Themes



This chapter begins with an examination of sustainable tourism literature, the central focus of this dissertation. Succeeding this, a survey of alternative tourism forms is conducted, namely ecotourism, marine ecotourism, and angling tourism. Ecotourism is touted as a definitive form of sustainable tourism hence a review aligns with the focus of this research. A synopsis of Bahamian tourism is also provided, relevant because The Bahamas are where this study is centered. Following this, a review of literature on local ecological knowledge is conducted, as this source of knowledge

forms the basis of information used to assess the sustainability of Bahamian bonefishing and finally, literature related to host perceptions of tourism is reviewed since sustainability of the fishery is considered through the perspective of angling guides. Research gaps in the literature themes are identified, and these provide rational for this dissertation.

## **2.1 Sustainable Tourism – Origins, Goals, Challenges, and Shortfalls.**

The publication of works by Carson (1963), Marsh (1965), Erhlich and Erhlich (1968) and others, revealed a shifting cultural zeitgeist toward a growing environmental awareness concerned with issues of overpopulation and environmental degradation. These efforts provided fundamental education to people increasingly impacted by one or both of these matters. Continued growing consciousness lead to the World Commission on Environment and Development's (WCED) seminal report, *Our Common Future*, commonly known as the Brundtland Report (1987:43), where sustainable development was defined as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". Five underlying principles of sustainability were identified through the Brundtland Report. These include: 1) the idea of holistic planning, 2) the importance of preservation of natural processes, 3) the need to protect biodiversity and heritage, 4) for development to ensure productivity is sustained in the future for future generations, and 5) that greater equity and opportunity between nations is sought (WCED, 1987). Sustainable development and sustainable tourism, premised on the same pillars of sustainability, pose significant challenges, both requiring shifts in society (Forbes,



1998), and inconveniences that most people are unwilling to make (Weaver, 2006). Overcoming the contradiction whereby economic development is deemed vital, yet associated growth results in environmental degradation on which that growth relies, is an unresolved paradox (Barrow, 1995; Jacob, 1994; Pforr, 2015). Achieving sustainability requires profound life-style changes (WCED, 1987) including a rejection of capitalistic principles, widespread adoption of renewable resource use, and abandonment of non-renewable dependency, practices not widely accepted (Hall et al., 2015; Hall and Lew, 1998). Theoretical and logistical issues perpetuate sustainable development and sustainable tourism discourse (Charlton, 1998), consequently Page and Thorn (1998) argue, good research and analysis are vital for planning and decision-making around sustainability. A lack of clarity in basic terminology further challenges comprehension (Butler, 2015). Tourism alone is an unclear concept (Wheeler, 2006), and the discipline is commonly criticized by scholars in traditional fields for being a study of only minor significance (Butler, 2015). Sustainability is an equally contested, “slippery” concept (Gallie, 1955-56; Milne, 1998), and a “matter of dispute” (Hall, 1998:13). From a tourism guise, Butler, (1991:26) argued,

“the overwhelming appeal of sustainable concepts lies in the generality of the concept, and the fact that the true cost of the implementation of the concepts have never been spelled out, where the costs are perceived to be a reduction in development, and in tourism terms, fewer tourists, less employment and reduced income, then the concept is not supported enthusiastically, or is interpreted in terms of purely economic sustainability, which means that the primary concern is with maintaining the long-term viability of the economy of the region being considered, rather than the viability of the physical and social environment. In areas that currently experience low standards of living, extreme low incomes, overpopulation and resource scarcity, such mundane concerns as survival perhaps deserve more consideration than they have had to date in the rush to impose the sustainable doctrine by an overly moralistic developed world.”

Vagueness of terminology and widespread, inappropriate and misleading acceptance (Croall, 1995) has led to questionable implementation and continued debate, more than two-decades since its inception (Butler, 1991; Butler, 1998; Butler, 1999; Butler, 2015). Noteworthy is the fact that some scholars view vagueness in sustainability terminology as an overlooked value where, although the idea may never be reached, the concept has provided a platform around which stakeholders can debate, while attempting to find a degree of consensus on which more sustainable decisions can be made (Redclift, 1987). Pforr (2015:25) argued that a lack of clarity permits the possibility that “almost everything can contribute to sustainable development to the point where policies that had been conceived in other contexts have since been relabeled as sustainable.”

Despite contradictions about its label, meanings and values, sustainable tourism is a popular topic for scholarly research, and growth in sustainable tourism has compounded (Zolfani et al., 2015). A study by Hall et al., (2015) identified increases in Scopus records containing the term sustainable tourism from 0 in 1989 to 665 in 2013. A broadened examination incorporating sustainability and sustainable development terms further revealed that while in 1980 there were 0 Scopus references, in 2013 there were over 100 000 references (Hall et al., 2015).

Sustainable tourism has many definitions, although the United Nations World Tourism Organization’s (UNWTO) classification is now widely accepted, and is the one adopted for use in this dissertation. The UNWTO (2014) states that sustainable tourism is, tourism that takes full account of its current and future economic, social and

environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities. (Other notable definitions are provided in Table 1 after Butler, 2015) Sustainable tourism is a “ubiquitous term” (Hughes et al., 2015), having evolved as an ethics-based antithesis to the capitalist-based mass tourism thesis (Weaver, 2013). Sustainable tourism has evolved as an approach to counter the negative effects of traditional mass tourism venues like mega resorts, cruise ships and casinos (Bramwell and Lane, 1993; Zolfani et al., 2015). Sustainable tourism is designed to balance environmental protection with cultural integrity and social justice, while promoting economic benefits to meet the needs of host populations in the long and short term (Liu et al., 2013). This second-generation tourism model differs from traditional ‘first-generation’ mass tourism venues (mega resorts/mega cruises) (Weaver, 2015), countering traditional mass-tourism models characterized by large-scale infrastructure developments, resource intensive systems, high tourist arrivals, and fundamentally unsustainable practices. Sustainable tourism has been in practice for over two decades (Buckley, 2012) assimilating sustainable development and tourism development paradigms (Hughes et al., 2015).

Table 1 – Select definitions for Sustainable Tourism after Butler (2015), illustrating the evolution of the term.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Sustainable tourism is tourism and associated infrastructure that: both now and in the future operate within natural capacities for the regeneration and future productivity of natural resources; recognizes the contributions that people and communities, customs and lifestyles, make to the tourism experience; accept that these people must have an equitable share in the economic benefits of local people and communities in the host areas.” | Eber, 1992:3                   |
| “Tourism, which can sustain local economies without damaging the environment on which it depends.”                                                                                                                                                                                                                                                                                                                                                      | Countryside Commission, 1995:2 |
| “Sustainable tourism is tourism, which develops as quickly as possible, taking into account current accommodation capacity, the total population and the environment... Tourism that respects the environment and as a consequence does not aid its own disappearance. This is especially important in saturated areas... sustainable tourism is responsible tourism.”                                                                                  | Bramwell, et al. 1996:10-11    |
| “Sustainable tourism must be economically viable, ecologically sensitive and culturally appropriate.”                                                                                                                                                                                                                                                                                                                                                   | Wall, 1997:483                 |
| “Sustainable tourism needs to walk the fine line between environmental conservation and livelihood fulfillment.)                                                                                                                                                                                                                                                                                                                                        | Lu and Nepal, 2009:14          |
| “Sustainable Tourism is a subset of sustainable development. Sustainable tourism is a tourism system that encourages qualitative development, with a focus on quality of life and well-being measures, but not aggregate quantitative growth to the detriment of natural capital.”                                                                                                                                                                      | Hall et al., 2013:1            |

## 2.2 Tourism Merits and Challenges

Considerable research has been conducted on the merits of tourism, both positive and negative. Tourism is a human activity that relies on common pool natural resources, yet tourism can contribute to their depletion (Hardin, 1968; Restless, 2015; Rutty et al., 2015). Economically, tourism can facilitate employment (directly and indirectly), education, infrastructure spending, and increased trade, generally positive outcomes. Negatively, tourism may lead to industry dependence, common in island

economies like The Bahamas, where resources beyond sun and sand are scarce. Tourism may also result in inequitable distribution of wealth and infrastructure spending, political catering to the industry, and economic leakages that may negate potential positive attributes. Tourism tends to promote low wages (Hightower, 2002), entry-level opportunities and gender-based employment (Cukier, 2002; Edgell and Swanson, 2013; Gorg, 2000). Socially, tourism can improve domestic and international relations, promote peace, preservation of culture and heritage (Zeppel, 1998), and reductions in religious persecution through improved understanding of foreign cultures. Tourism has been recognized as a means of poverty alleviation, and associated social issues, important for achieving sustainability. Pro-poor tourism is the use of tourism as a means of poverty reduction, an argument employed for tourism development and expansions (Truong, 2015). Wieranga (2008:13) however concluded in a comprehensive study, that pro-poor tourism is “more of a livelihood supplement, than a poverty solution” thereby challenging potential sustainable tourism outcomes. Tourism may also result in social decline in the form of prostitution, increased crime, xenophobia, collapse of traditional family structures (Jafari, 2001), and commodification of arts and culture (MacCannell, 2010). Environmentally, tourism has been recognized as a catalyst for parks, conservation and preservation (Frost and Hall, 2009), yet the cumulative global effects of tourism when examining resource use, water consumption, energy and carbon emissions, land use change, dispersion of disease and biodiversity losses, are overwhelmingly unsustainable (Rutty et al., 2015; Gössling, 2002). Hall and Lew (2009) suggest the contribution of global impacts as a result of tourism will continue to grow in response to increasing numbers of domestic and

international travelers, intensified energy and water consumption at an increasing number of luxury resorts, and a surge in long-distance travel, leading some scholars to conclude that, “tourism’s relationship to the environment is increasingly problematic” (Hall et al., 2015:16). These issues are magnified through traditional mass tourism models where declines of natural capital at micro and macro levels lead to both short and long-term irreparable consequences (Gössling and Hall, 2006; Hall, 2010). Shifting environmental awareness, along with increased study on the economic and social shortcomings of tourism have practically and theoretically accelerated sustainable tourism practices and alternative tourism forms. Examples of alternative tourism forms include: pro-poor tourism, ecotourism, agri-tourism, food tourism, and dark tourism – alternatives to mass/high density tourism markets like mega-resorts, casinos and cruise ships which have also been called first-generation tourism models as they evolved first.

The assumption behind alternative tourism lies in the implicit understanding that small-scale developments, and low tourist numbers will reduce negative tourism impacts on local communities and environments (Moscardo et al., 2001). This supposition is now widely recognized as a growth paradox whereby an increasing number of travelers are now seeking alternative tourism opportunities over stressing existing alternative tourism infrastructure, and creating demand for new developments along with expansion into untouched areas; all practices that counter alternative tourism (Butler, 2015). As Weaver (2015:14) explains, “The growth paradox of success posits that satisfied customers of deliberate alternative tourism products, stimulate increased demand for such products through word-of-mouth, mass media and social media publicity. Rather than implemented quotas, demarketing or other restrictions to

maintain a conceptually ideal low-level equilibrium, destination and product managers tend to respond to this demand by increasing their carrying capacities, thereby moving toward mass tourism.” Scholars critical of mass tourism, include Poon (1993) and Croall (1995), among others, although according to Butler (1999:13) “it has yet to be proven that all examples of mass tourism are unsustainable.” Fundamentally, imbalances of economic, social, and the environmental foundations of sustainability, are core issues to overcome (Hall et al., 2015). Local stakeholders must be incorporated in sustainable tourism planning (Barrow, 1995), political support for the triple bottom line is vital (Dodds and Butler, 2009), and challenges associated with environmental protection (Butler, 2015; Ram et al., 2013), and climate change (Gössling et al., 2013), all contribute to the unlikelihood of achieving real sustainable tourism. A growing number of scholars claim true sustainable tourism is impossible, simply a myth. They contend a shift towards more responsible travel is more realistic, recognizing existing gaps between sustainable tourism theory and practice (Buckley, 2012; Goodwin, 2016; Hughes et al., 2015; Nepal et al., 2015). As Hughes et al. (2015:3) state, “almost all the world’s activity in tourism can be described as mass tourism”, while alternative tourism is expanding thus resulting in similar impacts noted in first generation tourism venues (Butler, 2015). Additionally, as Pearce (2000) identifies, most alternative tourism relies on the same transportation systems used by mass tourism destinations. Weaver (2015:20) in response to ‘stagnation and unproductive discourse’ around sustainable tourism, argues for a third generation tourism model; one that amalgamates mass tourism, growth and sustainability, in what he refers to as ‘enlightened mass tourism’. Emerging from the sustainable tourism

impetus, are alternative tourism forms like ecotourism, another hotly debated concept. As Butler (1992:37) explains, “ecotourism and alternative tourism simply represent the thin edge of the wedge and will eventually lead to large-scale, inherently unsustainable developments.”

### **2.3 Ecotourism as an Alternative form of Sustainable Tourism**

Tourism is a resource-intensive industry (Lu and Nepal, 2009). Alternative tourism forms like ecotourism, have developed to counter intensive resource usage typical with first generation tourism models (mass tourism – resorts, cruises etc.). Ecotourism is a form of nature-based tourism (Valentine, 1992), or ‘sustainable tourism’, and the division between the terms is “not always clearly defined” (Burton, 1998: 757). Frequently referred to as, wildlife tourism, adventure tourism, responsible tourism, science tourism, ethical tourism, soft-tourism, environmentally friendly tourism, adventure travel, non-consumptive tourism, and low-impact tourism (Goodwin, 1996), ecotourism has emerged as a growing subset of sustainable tourism. The change from mass tourism forms to alternative tourism, is in response to egocentric or homocentric perspectives, shifting to biocentric ethical ideologies (Acott et al., 1998; Fennell, 2000; Wearing and Neil, 2000; Weaver, 2002). A minimalistic (Weaver, 2005), holistic concept of nature is implied through ecotourism (Fennell, 2012) where ecotourism ventures are truly ‘sustainable’. Lu and Nepal (2009) identify four basic principles of sustainability: holistic planning and policy, preservation of critical ecological systems, preservation of culture and heritage, and developments that are relentless and unfaltering in efforts to ensure vitality for future generations. Although



true sustainability is innately questionable, Lu and Nepal (2009) explain, that sustainable tourism is no longer a form of tourism, rather a ‘goal to be achieved’ through other forms of tourism, primarily ecotourism. As Weaver (2002:254) explains, “it is impossible to assert beyond any doubt that a particular destination or product is sustainable, unless a highly diluted anthropocentric conception of sustainability is followed.” This alone fosters skepticism around ecotourism or sustainable tourism principles and practices.

In addition to a myriad of terms used synonymously for ecotourism, more recently, there has been some discussion of the concept of ‘slow tourism’. Slow tourism is intended to promote sustainable practices, focusing on reducing the potential losses to destination distinctness, commonly transpiring through mass tourism models. Conway et al. (2010:10) explain slow tourism as an experience being “more authentic, slow-paced and flexible”, which “meets the needs of host communities.” favorable for achieving sustainability. Enhancing commonly poor communities aligns with pro-poor tourism virtues, thus pro-poor tourism ideals and terminology are frequently intermixed with slow tourism and even ecotourism (Fennell, 2006). Slow tourism, according to Campbell (1996) should reflect the ‘three E’s’ of sustainability - economy, equity and environment, much like ecotourism. From a management perspective, the concept is better approached from a bottom up ideal, or a community-based model (Conway and Timms, 2010).

Since its inception, the definitions for ecotourism have been “elusive and controversial” (Weaver, 2002:252). There has been “confusion in semantics” (Weaver, 2001:73), with little consensus as to an appropriate definition (Garrod and Wilson,

2003; Ross and Wall, 1999). The origin of the term is subject to debate however some mention of terminological evolution is necessary, to contextualize current understanding and application.

According to Weaver (2002), the term ecotourism first appeared in works by Romeril (1985). While Fennell (1999) states confusion surrounds the etymology of the term, citing Orams (1995) and Hvenegaard (1994), who identify use of the term in the late 1980's, Higgins (1996) proposes earlier references to the late 1970's. Earlier still, according to Fennell (1999), Hertzner (1965) made reference to ecotourism through associations between tourists and their environment. Despite uncertainty, most scholars now reference work by Ceballos-Lascuráin (1996) who used the term in the early 1980's (Boo, 1990; Burton, 1998; Fennell, 1999; Orams, 1995, 1999). More importantly, the definition of ecotourism is also as contradictory as sustainable tourism. According to Ceballos-Lascuráin, ecotourism is defined as the experience of traveling to relatively undisturbed areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as existing cultural manifestations. While this interpretation of ecotourism has been widely accepted, ecotourism has been variously interpreted. Fennell (2001) identifies 85 definitions for ecotourism alone, each somehow incorporating principles of conservation, ethics, sustainability, education and community benefit. Weaver and Lawton (2007) ultimately conclude that Blamey's (1997) explanation inclusively encompasses ecotourism traits including: the inclusion of nature-based attractions, education-based tourist interactions within given attractions, and management and experiences based on practices associated with ecological, social, and economic sustainability. The International

Ecotourism Society (TIES) identifies ecotourism as, responsible travel to natural areas that conserves the environment and improves the wellbeing of local people (TIES, 1990). This less concrete inclusive definition leaves significant room for interpretation and consequently potential misuses, while incorporating core values implicit in earlier definitions. Tacit underlying understandings of ecotourism embrace inclusion of the three pillars of sustainability (economy, environment and society), as Butler (1992) explains, if ecotourism impairs natural resources then it isn't ecotourism. Indeed, economic and social preservation and enhancement are vital components of ecotourism. Although definitive identification of ecotourism ideas remain vague, further subdivision into 'sub' categories of soft and hard ecotourism has alleviated some misconceptions (Laarman and Durst, 1987). Weaver and Lawton (2002) clarify differences between hard and soft ecotourism, explaining that hard ecotourism is the purest form, emphasizing intense personal and prolonged encounters in nature. Conversely, soft ecotourism is characterized by short-term interactions in nature that are frequently a small component of multipurpose tourism experiences. Weaver (2005:446-7) expands on these terms explaining that,

“soft (ecotourism) activity involves larger numbers of participants who make relatively short and physically comfortable visits to serviced sites as one component of a multipurpose experience that is facilitated through the formal industry. It is associated with a superficial or veneer commitment to environmental issues, and the pursuit of a shallow interaction with nature that is mediated through formal interpretation. Hard ‘ideal’ type (ecotourism) entails smaller numbers, who are purportedly more environmentally aware, visiting semi-wilderness or wilderness destinations where few if any services are available. They embark on relatively long and specialized trips that are physically and mentally challenging, involve the pursuit of a deeper interaction with the natural environment, and are arranged independently or through exclusive packages.”

Newsome et al. (2002) equate 'hard' and 'soft' ecotourism terms to 'primitive' settings (hard ecotourism opportunities) and 'developed' settings (soft ecotourism opportunities), to potentially distinguish accommodation forms and likewise, participants. Weaver (2002) in discussing the two forms economically, suggests that despite sustainable economically viable intentions for hard ecotourism, in most destinations large scale or 'soft ecotourism', may be more apt to produce greater economic benefits due to volume. Environmentally, some have suggested soft ecotourism, more concentrated (like mass tourism), may pose less environmentally threatening than its 'hard' counterpart, focusing more tourists in already disturbed 'front stage' areas rather than impacting pristine, 'backstage' wilderness with any visitors (MacCannell, 2002). Lawton (2001), refers to the '95-5' rule (95% of travelers cluster around primary access points, about 5% of the area of any given tourist destination), leaving hard ecotourists occupying the remaining 5%, potentially resulting in greater damage as a result. Thus, "the boundary between soft ecotourism and conventional mass tourism is fuzzy" (Weaver and Laarman, 2007:175). Ultimately, cumulative effects from either form need consideration, and fundamentally neither soft nor hard ecotourism are void of negative environmental impacts as both can introduce exotic species, add stress to wildlife, and compound social unrest (Weaver, 2002).

Acott et al. (1998) parallel hard and soft ecotourism forms with deep and shallow ecotourism respectively. Their assumption is founded on deep and shallow ecology practice, where deep ecology is founded on deeply biocentric or ecocentric ethics, opposing anthropocentric or technocentric ideologies (Devall and Sessions, 1985). Deep ecology proposes "biotic rights and biospherical egalitarianism" to all

flora and fauna thereby ensuring equality between all life forms. Consistent, regardless of academic terms, is the notion that shallow or soft ecotourism, “verges on a form of mass tourism”, a commodification of nature, versus “genuine attempts at environmental tourism” associated with deep or hard ecotourism (Acott et al., 1998:239.) References to marketability of “eco” tourism products ”(specifically, shallow or soft forms), cite visitors being wooed to remote destinations while maintaining “western standards of comfort and accommodation”, thus illustrating abuse and misuse of terminology, regardless of the term used. Unfortunately, as Fennell (2002:14) cynically states, the chosen, supported, and marketed definition will be the one that generates the most income.

Critical to remember, ecotourism is a form of alternative tourism, mutually exclusive of mass tourism to some extent (Weaver, 2001). According to Weaver (2001:70), ecotourism is attractive to increasingly “green” markets, provides sustainability and environmentally ‘friendly’ ethos, offers “diversification opportunities for mass tourism”, provides significant “market and revenue flows to position ecotourism as a major resource stakeholder”, and provides a catalyst for effective environmental management. Essentially, ecotourism is everything that mass tourism is not, yet some argue ecotourism can provide opportunities for mass tourism markets potentially reducing the sustainable ‘ness’ of the approach. Given the financial and associated political clout garnered through mass tourism markets, there are risks of appropriation of smaller ecotourism operations (Weaver, 2001). While advocates of ecotourism have promoted the philosophy as the ‘epitome of sustainability’ (Wheeler, 1994), cynics dismiss the term as a buzzword, marketing ploy, or greenwashing. In

practice, misuse of the term is widespread, largely dependent on the definition employed, and the scope of interpretation.

## **2.4 Marine Ecotourism**

In 1996, the International Ecotourism Society separately identified marine ecotourism practices, noting promise for coastal communities through potential revenue generation, environmental conservation, and related educational opportunities (Lück, 2008). According to the IUCN (1991), a marine environment is characterized as “any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna and historical and cultural features”. Marine ecotourism is a ‘subset’ of ecotourism with synchronous ‘global’ attributes including potential social, economic, cultural and environmental ramifications. It provides significant economic injections to remote, ‘peripheral’ communities (Garrod and Wilson, 2003). As Cordell (2004) explains, U.S. coastal states comprise only 11% of the U.S. in land area, yet 50% of the population reside in these states, illustrating high population density in coastal regions, and potential associated stresses through life-ways including tourism and ecotourism (Agardy, 1993). Threats facing coastlines may be further magnified on island destinations, and under impending climate change impacts.

Environmental protection in marine regions is therefore critical, perhaps more so than terrestrial destinations, considering the potential negative consequences associated with tourism in aquatic environments (Carter and Carter, 2007; Garrod and Wilson, 2003; Zwirn et al., 2005). Marine ecotourism is touted as a means for achieving conservation goals while benefitting local populations. Marine ecotourism

venues can help fund research on marine species and habitats, help with conservation programs, assist in raising the profile of a marine resources in the planning process, provide an economic rationale for environmental stewardship, and provide focus for social and cultural regeneration of coastal communities (Garrod and Wilson, 2003). To meet these goals, marine ecotourism must be nature-based, should have educational components, and be premised on sustainability, much like terrestrial ecotourism destinations.

A cornerstone of marine ecotourism is sustainability, yet achieving ‘true’ sustainability in ecotourism, or any form of tourism is challenging and debatable (Nepal et al., 2015; Weaver, 2002). In a marine context, sustainability is even less likely given the “open nature of marine environments” which bring “considerable problems for management (and sustainability) including: the large spatial extent of oceans and seas, it’s multi- dimensionality, and the continuity of habitats and ubiquitous currents” (Carter and Carter, 2007). Unlike some terrestrial ecosystems, marine environments are not inhibited by geographical and political boundaries consequently associated management practices require international organization, commitment, funding and assessment. Hall (2000) refers to management of tourism in marine environments as ‘meta-problems’ considering interconnectedness and likewise fused planning and policy issues. Added challenges and multiple stakeholder groups ensure greater strains on the sustainability process. Laffoley et al. (2004:58) expound challenges of ‘multiplicity of spatial and temporal scales’, requiring flexibility in practice for equilibrium in social, ecological and economic partitions.

As Carter and Carter (2007:222) explain, “One of the most effective ways in which tourism can both conserve nature, and improve local livelihoods, is through community approaches to natural resource management.” Integrated Coastal Zone Management (ICZM), promotes community participation by bringing stakeholders together in co-decision making efforts (Garrod and Wilson, 2003; Lück, 2008). It is a holistic ecosystem-based approach to resource management, which aims to improve the lives of local community members, while maintaining biodiversity and ecological integrity (GESAMP, 1996). Community participation in resource management can provide local or traditional knowledge acquired over decades of observation and consequently enhancement of policies, implementation monitoring, and adaptive co-management of decision-making, all components of best practice towards sustainability. Furthermore, community participation in resource management is not only recognized as a method for improving resource management outcomes, but a way to reduce poverty (Pomeroy, 1995). Since coastal marine ecosystems are inherently complex, flexibility and adaptability to diverse resource bases are critical. Carter and Carter (2007:223) elucidate that, “community based management systems have the advantage of being adaptable to site-specific socioeconomic, biological and physical characteristics”.

Marine ecotourism encompasses, “a truly bewildering array of activities” (Carter and Carter, 2007:4), the scope of which appears to depend on the scholar and application (Ryan, 2004). While cetacean and whale shark viewing are regarded as forms of marine ecotourism, so too are sea-kayaking, snorkeling, and scuba diving (Carter and Carter, 2001; Garrod and Wilson, 2003). Some scholars include swimming,



kiteboarding and windsurfing (Carter and Carter, 2007) while others specifically exclude them (Cisneros-Montemayor, 2011). Inclusion of angling is likewise contested, where Cisneros-Montemayor et al., (2011), and Adams et al. (2019) include angling within ecotourism activities, others reject the practice or avoid mention of it altogether (Carter and Carter, 2007). Indeed, Cordell (2004) cites statistics from a participatory study in the U.S. where saltwater angling was ranked third in importance when considering saltwater tourism based activities (behind swimming and visiting features/attractions). Similar to ecotourists' attributes, marine ecotourism participants are generally older, better educated, willing to pay more for vacation, travel more frequently, are intrinsically motivated, and they actively seek local information and educational opportunities (Garrod and Wilson, 2003). These attributes may improve sustainability outcomes.

#### **2.4.1 Merits of Marine Ecotourism**

Like other forms of ecotourism, marine-base ecotourism has beneficial and negative impacts on host communities. 'Spread' effects (positive impacts), include enhanced environmental awareness and education, advantage to business, and comprehension of best environmental practice. Conversely, 'backwash' effects (negative impacts), include environmental degradation (freshwater over-use, coral damage due to moorings, coral bleaching through climate change-heavily impacted by carbon emitting travel, sea grass erosion due to excessive and inappropriate boating, or fisheries declines due to over consumption), loss of cultural authenticity, foreign ownership, leakage and the like (Carter and Carter, 2001). Moreover, high value

locations (sandy beaches) are frequently generated through removal of rich bio-diverse 'low value' locations like mangrove swamps, and tidal marshes critical for reducing coastal erosion, enhancing water quality, providing nursery habitat for fish and other organisms, and rich species composition (Hardiman and Burgin, 2010).

Regardless of the impact that ecotourism may have on a local ecosystem, it is important for management of marine ecotourism destinations, as Butler (1998:28) explains, to considerate that "tourism is a part of the global system and cannot be tackled in isolation, spatially, economically or temporarily. It is vital that a move is made beyond the tourism centric view such that it is inappropriate to discuss sustainable tourism any more than one might discuss any other single activity. We cannot hope to achieve sustainability in one sector alone, when each has links to, and is dependent upon one another". The anthropocentric approach to high value marine environments requires a philosophical shift, and education garnered through marine ecotourism might help facilitate this.

## **2.5 Recreational Angling as Ecotourism**

The preceding sections have highlighted that sustainable tourism and ecotourism are contested concepts. In a similar vein, there are also debates over whether angling is a form of ecotourism (Borsch et al., 2008; Zwirn et al., 2005). Borsch et al. (2008:269) state, "...it is striking how little of this research (recreational fishing research) focuses exclusively on recreational fishing in tourism. This may be partly because many of these studies are conducted from management or resource conservation perspectives." It is widely accepted that fishing is part of the nature-based

wildlife tourism industry, given nature is critical for the experience (Borsch et al., 2008). Interestingly, the inclusion of the word “sport” to fishing practices alters potential classifications. Butler (1992) argues that “sport hunting and fishing” should be included within wild-land tourism, yet another term in the quandary. It is apparent that ecotourism should be studied as a ‘subset’ of nature-based tourism (Olindo, 1991), yet while some scholars have attempted to clarify the appropriate categorization of angling within ecotourism (Fennell, 2012), there is no consensus on this matter (Zwirn et al., 2005). The crux behind exclusion of angling from ecotourism lies in the ‘consumptive’ nature of angling, with ecotourism often touted as being a less consumptive form of tourism (Fennell, 1999:169). Even the idea of ‘consumption’ comes to question, as some argue consumption may be a moral act of caring (Bryant and Goodman, 2004). From an angling perspective, Buckley (2009) defines consumptive nature-based tourism as hunting or fishing with non-consumption activities limited to wildlife viewing while Holland et al. (1998) argue catch and release angling in the billfishing industry is non-consumptive because caught fish are released. Borsch and Policansky (2008) illustrate, there are several studies focusing on consumption within recreational angling that all conclude, ‘specialist anglers’ (like flyfishing or flats anglers anglers) fish for ‘specialist species’ (like bonefish), for intrinsic purposes rather than extrinsic motivations, meaning biophysical consumption of fish is less important than catching (Ditton et al., 2002; Fedler and Ditton, 1986; Franklin, 1999, 2001; Greiner et al., 2013; Matlock et al., 1988; Oh et al., 2006). In response, Lovelock (2015) states the importance of making a distinction between consumptive and less consumptive practices. Potentially detrimental to angling practices is the selected focus on ‘target

species', which may hinder sustainability in tourist destinations (Greiner et al., 2013; Hardiman and Burgin, 2010). Normann (2008:243) extends on this idea stating, "The most specialized forms of marine fishing tourism give the highest revenue, but they depend on high-quality limited resources and therefore require good planning to be sustainable." Bonefishing in The Bahamas exemplifies this form of high-quality limited resource angling. A study by Sutton and Ditton (2005) on the other hand, examined the suitability of replacement species in the absence of target species. They concluded that anglers display willingness to seek acceptable substitutions in cases where primary species are no longer available (like bonefish in The Bahamas), if suitable alternatives exist.

### **2.5.1 Catch and Release Angling and Implications for Consumption Classification**

Catch and release angling practices have also been examined from ethical considerations. Fennell (2000, 2006, and 2012) questions the morality of angling under assertions that fish feel pain and therefore intentionally causing them harm is not conducive of ecotourism principles. Borsch et al. (2008) suggest the sole method for ensuring biocentric sustainability in fishing tourism, is to limit opportunities to viewing and feeding experiences, far from the current popular norms. Given the diverse set of approaches and technologies employed in recreational angling, Fennell (2012:182) attempts to quantify the morality of these sub-sets through interaction forms. His scale ranges from competitions (largely catch and release), which he deems as nature-based tourism, to learning and appreciation forms, with no direct contact with fish (e.g. fish viewing), as true ecotourism. All other forms (trophy fishing, pleasure fishing, angling

for commerce, artisanal angling etc.) lie somewhere in the middle. Fennell (2012) further suggests that commercial fishing is more ethical than recreational angling, or even catch and release angling given angling motivations (necessity versus recreational) associated with these practices. It appears the effects of catch and release angling require continued consideration for accurate compartmentalization of angling within ecotourism practices.

As Lovelock and Lemelin (2008:13) explain,

“The extent to which catch and release angling is consumptive or non-consumptive has been debated, as stress upon the target species results when fish are removed or consumed from their natural environment, albeit temporarily by anglers. The debate about whether hunting and fishing are forms of ecotourism remains contentious. Consumptive wildlife tourism therefore becomes ultimately vulnerable to the strong voice against the continuing of bloodsports (hunting)”.

‘Consumption’ itself, as a component of the definition, comes under scrutiny within related literature in order to resolve the issue. Freese (1998) defines consumption in wildlife tourism as the deliberate killing of animals or removal of body parts for later use, while Fennell (2000, 2006, 2012), suggests consumption could include taking of animal spirits through photography. Lovelock and Lemelin (2008:15) conclude a dichotomy between consumptive and non-consumptive (non-ethical) tourism forms subside when “broader ecosystem integrity is considered” thus ameliorating this argument. Fennell (2012) also argues catch and release-angling results in post-release mortality; hence it should be regarded as a consumptive practice given temporal considerations. In response, scholars have conducted catch and release mortality studies on a variety of game-fish, in numerous fisheries, concluding that with proper handling, angling technique and angling gear, post-release mortality is low (although only short term studies have been conducted failing to assess fish health days after capture and

release) (Arlinghaus et al., 2013; Bartholomew and Bohnsack, 2005; Cooke et al., 2006; Cooke and Sneddon, 2007; Cooke and Suski, 2005; Danylchuk et al., 2007; O'Toole et al., 2010; Stein et al., 2012; Suski et al., 2007; Thorstad et al., 2004). As a result of the short-term nature of these studies, and the relative importance of best practices in handling of fish for optimal post release mortality reduction, debate continues around catch and release morality and efficacy.

According to Borsch and Policansky (2008), there is a tendency for natural resource management practitioners to be more accepting of fishing as a form of ecotourism, while those focused on ecotourism practices (e.g. bird or whale watching), are more critical of its inclusion. Economically speaking, recreational angling frequently exceeds revenue generation garnered through commercial exploits (Borsch et al., 2008). Given the importance of 'improving the livelihoods of local peoples' epitomized through ecotourism or marine ecotourism, conclusions could be drawn where angling may indeed be a form of ecotourism, although the question of leakage requires consideration. If managed sustainably, nature-based tourism and recreational angling may be less ecologically harmful than other forms of tourism or economic activities like commercial fishing, mining, agriculture, or forestry (Borsch et al., 2008). A noted hindrance to achieving sustainability lies with insufficient resource statistics in data poor areas. This, "coupled with low public awareness about these activities", make effective resource management and tourism-related decisions challenging (Borsch et al., 2008:287). These are both issues facing The Bahamas bonefishing industry where many Bahamians are unaware of bonefishing and recorded catch rates for bonefish do

not exist leaving local guide knowledge vital for assessment and management of this resource.

From the perspective of ecotourism, it is plausible that bonefish tourism, the central focus of this dissertation, a form of angling that commonly employs the practice of catch and release fishing, may be a form of ecotourism. Indeed Adams et al., (2019) make this connection although the actual scholarly consideration of the appropriateness of this activity within an ecotourism umbrella has yet to be conducted. In the context of hard and soft ecotourism forms, bonefishing more clearly parallels soft ecotourism forms and is consequently less ecologically sound than some consider.

This conclusion when addressing bonefishing tourism may provide rationale for the use and misuse of ecotourism labeling for fishing-based destinations. Ecotourism terms may be used as a means to draw more individuals to this form of tourism while making the suggestion that it is more environmental since fish are released.

## **2.6 Tourism and bonefishing in The Bahamas**

The Bahamas have a lengthy history of tourism, originating during pre-colonial times (Craton, 1986; Johnson, 1989, 1996; Saunders, 1991). Economic impact studies show tourism significantly contributes to the growth of island economies (Seetanah, 2011). In The Bahamas, tourism generates roughly US \$2 billion annually, largely based on mass tourism cruises and resorts on either Grand Bahama Island or New Providence (Bahamas, 2012). Recreational angling tourism in The Bahamas, is a significant source of income for many Family Island communities – islands in the archipelago other than New Providence where Nassau the capitol is located or Grand

Bahama Island, the second most populous Bahamian island (Fedler, 2010). The sector reportedly produced US \$169 million in 2018 primarily through periphery visits (Fedler, 2019). The Bahamian bonefish angling industry has been referenced as ‘ecotourism’ and is being marketed accordingly (see Adams et al. 2019; and The Andros Conservancy and Trust (ANCAT) who commissioned a study of the island’s tourism industry under Mac Leod (2010), highlighting bonefishing as an ecotourism activity).

Although vital for The Bahamas, bonefishing tourism has received little academic examination, and none in the tourism arena. Despite claims and marketing, inclusion of this industry within an umbrella of ecotourism is debatable. Following Holland et al. (1998), the tourism sector aligns well to the TIES definition. It is characterized by anglers accessing a unique resource, deemed ‘unique clientele’. These are users of resources in an environmentally ‘responsible’ manner (catching and releasing), who are providing economic support for resource conservation, through donations to non-governmental organizations (NGO’s) like Bonefish and Tarpon Trust, or the Bahamas National Trust. Moreover, anglers are providing an economic advantage over alternative uses of the resource (recreation versus commercial angling), while providing economic benefits to local populations (guides, lodge operators etc.). Omitted from this equation, albeit critical to ecotourism ideology is the importance of education for hosts and guests. Arguably this too is achieved for travelers through contact with knowledgeable angling guides, through related NGO’s, and for hosts through contact with traveling anglers who statistically have above average levels of education (Fedler, 2010).



Scace et al. (1992) discuss the importance of qualified and certified guides in ecotourism operations. In The Bahamas, some guides have formed NGO organizations in order to legitimize the industry, certify guides to a standard, and offer education to members and non-members, while working to conserve local resources. Groups like the Bahamas Fly Fishing Industry Association (BFFIA) have set working priorities to help align the industry with sustainable tourism practices. An unintended outcome of ecotourism occurs, particularly in remote communities (like Family Island villages in The Bahamas) when the industry allows the ‘current elite’ to maintain or further develop their dominance (Weaver, 2002). While historically this has been the case in Bahamian bonefishing, this trend is changing, illustrated by local Bahamian ownership of guiding businesses and lodges. Despite this, financial leakages from Family Island communities are considerable. In The Bahamas, tourism leakages are as high as 90% (Fedler, 2010), a common occurrence on SIDS where local resources are insufficient to support variability in tourism demand let alone local residents. If ecotourism conserves the environment and improves the “well-being” of local people as defined by the International Ecotourism Society (1990), leakage should be lower. This high rate of leakage indicates that Bahamian bonefishing is not an ecotourism-based economy, and participants by definition, are not eco-tourists. More broadly, because of the tendency for high import levels and high leakage levels on SIDS, it is probable that ecotourism is impossible under this parameter.

Fortunately demographics and associated higher education levels in participants to the Bahamian bonefishing industry have helped shape a conservation-centered approach to a majority of angling practices in this fishery. Indeed, for the most part,

wealthy traveling anglers have encouraged the creation of protected areas, funding research through donation, and promoting education for best practices in angling. While many marine recreational fisheries are multi species in nature (Sutton and Ditton, 2005), this fishery is dependent almost exclusively on bonefish (Davis, 2017). Consequently, sound management of bonefish is vital to ensure longevity for recreational purposes. It is plausible that ecotourism labels if used cautiously, may help achieve this end. Relaxing of specific characteristics associated with formal ecotourism, namely leakage factors, may help ensure a better fit to the term. Indeed with improved management efforts, high leakage rates could be lessened through development of locally produced agriculture goods as is happening in South Andros and on Abaco. Given the tremendous variability of definitions available, and the ongoing discourse, there is little doubt that with adoption of specific ecotourism ideals, the bonefishing recreational activity can aptly be included as a form of sustainable tourism like ecotourism. Irrespective of what the fishery is called, its economic impact to Family Island communities demonstrates the need for preservation.

## **2.7 Local Ecological Knowledge**

Local knowledge (LK), specifically fishers' knowledge (FK), forms the basis of data for this dissertation, on which to examine sustainable tourism practices in The Bahamas bonefishing sector. As such, examining local knowledge literature, and differentiating LK from local ecological knowledge (LEK- knowledge specifically associated with ecology and local environments), along with traditional ecological knowledge (TEK) is warranted.

As Johannes and Neis (2007:41) explain, “The knowledge that indigenous, artisanal or commercial fishers and marine hunters accumulate over the course of their fishing careers, can be invaluable to marine researchers despite its low scientific reputation among methodological purists.” Sustainable tourism requires a balance of society, economy and the environment. As a result, knowledge and understanding of local environments through either scientifically formulated studies or through local knowledge holders, is important. Scientifically based ‘western’ knowledge systems, can lack sufficient data for informed decision-making, prompting acquisition and use of local knowledge. Planners and managers, in facing increased environmental degradation and increasing population, are increasingly seeking alternative sources of knowledge for improved management, opting for co-adaptive management practices, which ultimately lead to greater long-term sustainability (Armitage and Berkes, 2007).

Traditional and local ecological knowledge sources provide detailed ecological data spanning decades and even generations (Berkes, 2012). Use of these knowledge sources has been hotly debated, although decision-makers are increasingly seeking alternative knowledge forms, especially in data poor regions, remote destinations or in cases where formal science has inadequately represented local peoples (Berkes, 2012).

Defining TEK is a priority when discussing the knowledge source. Researchers employing TEK have debated appropriate definitions for years (Balick, 2007; Johnson, 1992; Menzies, 2006; Murray, 2011; Nadasdy, 2013; Pierotti, 2011; Tsuji and Ho, 2002). While TEK is, “a library of information on how to cope with dynamic change in complex systems.” (Berkes et al., 2000:1252); it is now widely accepted that, “TEK is a cumulative body of knowledge, practice, and belief, handed down through generations

by cultural transmission, about the relationship of living beings (including humans), with one another and with their environment.” (Berkes et al., 2000; Moller et al., 2004). TEK is characterized by practical skills and wisdom developed at local scales through earning livelihoods from local environments over successive generations. (Berkes, 2012; Berkes et al., 2000). Essential elements of TEK therefore include: knowledge acquisition through experiential learning in response to environmental variation, and transfer of knowledge orally and inter-generationally. TEK is frequently defined as a way of life rather than a set of specific intellectual propositions (Failing et al., 2007). This form of knowledge is experience based, interdisciplinary, holistic in ideology and is anchored firmly in the experience of place (Bohensky and Maru, 2011; Failing et al., 2007). Since cultural life-ways were developed from TEK, there exists great connectedness between spirituality and TEK; this appears to have reduced the validity of TEK within the scientific community. TEK and LEK are not inclusive; the former is associated with indigenous peoples and spirituality, as well as temporal and spatial scales transcending generations, while LEK is shorter term (likely), not spiritual in a religious sense, although equally important to enhanced resource management especially in the absence of aboriginal peoples holding TEK. Terms for TEK or LEK appear to be frequently used interchangeably and at times inappropriately. For purposes of simplicity, ‘local knowledge’ (LK) will be employed moving forward.

### **2.7.1 Terminology Uncertainties**

Understanding local knowledge applications requires the examination of associated terminology. Terminology employed to discuss LK has caused confusion

and tension due to racial undertones and implications of superiority. LK as a term does not always imply knowledge associated with aboriginal, indigenous or first nations peoples. “While LK is thus not unique to aboriginal culture or ethnicity, TEK is far more likely to be prevalent among aboriginal people who continue to participate in a mixed, subsistence-based economy because of the property relations and continuity of practice that typify their communities’. (Usher, 2000:12). This fact has lead to significant discourse and the use of a variety of labels including terms like: Indigenous Knowledge (IK), Aboriginal Knowledge (AK), Local Knowledge (LK), Indigenous Ecological Knowledge (IEK), Aboriginal Ecological Knowledge (AEK), and Local Ecological Knowledge (LEK). IEK or TEK seem to appear most frequently (Bohensky and Maru, 2011) although LK, IK, and TK have also been used widely. “TEK practitioners have observed that knowledge or information by itself is subject to serious misapplication if not informed by wisdom. Because of this, TEK is often referred to as Traditional Ecological Knowledge and Wisdom (TEKW)” (Ford, 2000:1249).

Still other terms, more closely related to knowledge sources, have also been coined and utilized like Fishers Knowledge or Fishers Ecological Knowledge (Budi Utomo, 2010). Discrepancy in terminology inevitably fosters uncertainty, tension, and hesitation from researchers attempting to integrate LK with scientifically generated data. Exacerbating this is the fact that, “knowledge from ‘other’ sources frequently comes under many names – local, lay, practical, extended, community, cultural, traditional, and so on.” (Failing et al., 2007:48). The derogatory connotation of “lay” people may lead to animosity, resentment and distrust on behalf of LK holders, and may result in accessibility issues.

Use of “traditional” in TEK even causes tension given ‘traditional’ implies repetition of a fixed set of data (Devin and Doberstein, 2004). It takes multiple generations to make observations, compare experiences with prior teachings, and conduct experiments testing the reliability of their knowledge (Pierotti and Wildcat, 2000). This concept is echoed by Failing et al., (2007:49), who explains, “tradition implies that knowledge is a static historical condition, whereas in fact it is dynamic, and continuously adding insights into a pool of knowledge”. LK is premised on knowledge acquisition from environmental adaptation transferred orally. Continually transforming ecosystems requires ongoing cultural change, adaptation and flexibility. LK is not static; it is an accumulated set of data through continued trial and error potentially resulting in failure or even death in extreme cases. LK transfer is also not static since transmission of LK by oral traditions allows holders of LK to adapt to changing conditions (Pierotti and Wildcat, 2000). LK is a constantly evolving way of perceiving observations. Although views covered by TEK are described as traditional, tradition does not negate change (Pierotti and Wildcat, 2000). Furthermore, reliance on new information in response to change reinforces the spatial orientation of LK compared to the temporal orientation of ‘western’ ethical systems (Pierotti and Wildcat, 2000). LK is empirically practical, and far from being a static body of knowledge. LK must be highly adaptive to meet the needs of human populations over long periods of time (Ford, 2000). This favorable attribute when employed into sustainable tourism management may facilitate greater resiliency in the face of inevitable change, which may lead to greater long-term sustainability.

Nadasty (2013:14) expands on linguistic uncertainty and terminological differences stating, “as with ‘tradition’, use of the English terms ‘environment’ and ‘ecological’ in discussions of LK tends to bias the discourse toward a Euro-Canadian perspective. These terms are products of a Western conception of the word. Implicit in their use are notions that human beings are separate and distinct from the rest of the world, and it is specifically the non-human part of the world which constitutes the ‘environment’.” Moreover, discussion surrounds use of ‘Western Science’ since, the term implies that the scientific paradigm is restricted to western cultures when clearly it is global (Failing et al., 2007). Warwick (2010) defines science as a way of studying the natural world, using a well-established, universally applicable and proven method, resulting in an ever-increasing body of knowledge capable of modification in light of new evidence. This methodology developed long before Europeans travelled to the new world, hence the term ‘Western Science’ is inaccurate. It may be coined this way to differentiate typical researchers employing a ‘scientific’, reductionist methodology from holders of LK, who apparently do not. Another source of terminological contention is the use of the word ‘integrate’ when considering use of LK. “The word ‘integration’ remains problematic, invoking past power imbalances and assimilation of LK by science, such that distinct attributes of LK are no longer identifiable” (Bohensky and Maru, 2011:10). Despite this, integration as a term and ideology is still used widely. The relative challenge of sorting out terminology speaks to the challenge of using LK in management.

### **2.7.2 Local Knowledge use in Resource Management**

Literature related to TEK or LEK use in resource management is extensive (Berkes, 2012; Bohensky and Maru, 2011; Huntington, 2000, 2011; Mauro and Hardison, 2000; Phuthego and Chanda, 2004; Woo et al., 2007). Globally, LEK use has become mainstream, incorporated into policy and law (Failing et al., 2007), becoming engrained in theory and practice through the International Conservation Union. “TEK was successfully mainstreamed throughout the Plan of Implementation at the World Summit on Sustainable Development in Johannesburg 2002. Provisions of ‘traditional knowledge’ or ‘indigenous and local resource management’ appear in no less than 19 paragraphs.” (UNESCO, n.d. cited in Budi Utomo, 2010). However, use of TEK/LEK goes beyond a duty to consent, it is logical to consult with local populations residing in a given area for generations since, “indigenous people often have good knowledge of their environments” (Hunn et al., 2003:93). As such, “more and more scientists are finding value in collaborating with local peoples. Increased political awareness and activism by local peoples have led to increased recognition of their knowledge and ideas” (Huntington, 2011:183). While integration of LK may be a current trend, “an essential component of LK and practice for ecologically sustainable outcomes, is a worldview that provides appropriate environmental ethics (Berkes et al., 2000:1259), hence it is a logical course. Although people frequently forget that, “humans are part of an interacting set of living things” (Berkes, 2012), human actions impact local environments.



### **2.7.3 Integration Challenges**

Opponents of LK argue LK is not grounded in a scientific approach, and therefore it is less credible. Science is formal and explicit while LK is informal and tacit (Reed et al., 2011). However, as Usher (2000:5) points out, “conclusions based on LK, tend to be verifiable or reinforced through trial and error, rather than by experimental design and formal hypothesis testing.” In effect then, LK does employ scientific rigor through cause and effect knowledge acquisition, and even hypothesis testing without scientific terminology or documentation. Opponents also argue the lack of formal written documentation reduces the conclusiveness of local knowledge. Proponents of LK on the other hand, argue that LK is based on oral traditions, however as Usher (2000) explains, this may in part be due to a reluctance to share. Researchers informed through LK appreciate that, “The spiritual philosophy and cultural teachings of LK are its foundation and cannot be divorced from its application”. (Lertzman, 2010:106). While LK differs from TEK, place and relevance to application are consistent between the terms. Recording LEK potentially detracts from the knowledge source due to linguistic uncertainties, bias, interpretation, and disconnection of connected ideologies (Usher, 2000).

Differentiating LK from science is a common theme throughout the literature, as Pierotti et al., (2000:1334) state: “Unlike Western philosophy, TEK assumes that humans are, and always will be, connected to the natural world; there is no such thing as nature existing independently of humans and their activities.” Berkes, (2012) states that science is superior to TEK as a knowledge source, with respect to systematic knowledge acquisition and processing. Science for example involves testing of

hypotheses, data analysis, and peer review. Woo et al., (2007) expand on this stating that, scientific knowledge and TEK are based on opposing perceptions that use different methods for acquiring and disseminating knowledge, usually focused on different spatial scales. TEK is based on generations of observations and experiential learning of local environments over which societies reside. Despite significant evidence in the literature debating superiority of science over LK, advocates of LK use are increasingly predominant. This may be due to greater understanding of TEK and LK, visionary academic researchers, a need to fill gaps in scientific data sets, a greater willingness to learn, and successful integration cases. Bohensky and Maru (2011), in a comprehensive literature review identified 43% of the 47 analyzed papers identifying “similarities” between science and LK. Methods for use and integration are discussed in 26% of the papers, and 21% of the papers recognize institutions, processes, and partnerships for maintaining and integrating LK. As Failing et al., (2007) explain, conceptions of what constitutes high quality, credible science is changing.

Proponents of TEK and LK application often highlight similarities between science and LK knowledge sources. Berkes et al., (2000) argues that LK is similar to science in that it is based on the accumulation of observations. Moreover, LK is peer-reviewed since acquisition of LK involves continual environmental adaptation, adaptations that are in part a result of collaborating with peers. These facts encourage potential usefulness of LK in planning and management for sustainable tourism. Greater understanding of motivations for acceptance of LK is needed along with discussion of limitations.

Inclusion of data from multiple knowledge sources is complex (Hoehn and Thapa, 2009). Multiple stakeholders with differing viewpoints may increase uncertainty in decision-making, time required for consensus, and stress financial constraints. However, benefits of participatory decision making, co-adaptive management, and adopting of LK into planning and management, appear more beneficial than detrimental. As Usher (2000:11) explains, “The most effective way of obtaining verifiable and generalized knowledge begins by interviewing the most knowledgeable persons in the community, who are the proper sources of LK.” This concept is echoed in the literature since proximity to resources ensures enhanced monitoring (Berkes et al., 2000). Furthermore, use of LK is thought to establish a more significant assessment of environmental data, thus a more holistic understanding between biotic and abiotic environmental factors (Ellis, 2005). LK is recognized to contribute invaluable information for science and natural resource management, often filling gaps unexplored using a traditional scientific method (Bohensky and Maru, 2011). Local communities and indigenous people already have “ready to use” systems for resource management, developed over centuries of resource monitoring and adaptation. LK is a source of knowledge based on interconnections between humans and their environment that lead to balance and harmony (Budi Utomo, 2010). In the face of increasing environmental impacts, adaptive management strategies that foster sustainability initiatives are needed. As Lertzman (2010:105) states: “[i]deologies of sustainability evolving in modern industrial cultures are convergent with stewardship principles long practiced by indigenous peoples.” According to Berkes (2012), certain circumstances dictate a greater use of LK, and adaptive management can provide a framework for its use.

Moreover, “adaptive management seeks to avoid ecological thresholds at scales that threaten the existence of social and economic activities, as do some traditional knowledge systems. Drawing on management practices based on LK, and understanding the social mechanisms behind them may speed up the process of designing alternative resource management systems” (Berkes et al., 2000:1260).

Consulting with local people and integrating local knowledge in sustainable tourism practices may be vital if the long-term goals are to empower local communities in resource management decisions. LK enhances resilience of social-ecological systems because this knowledge, accumulated through experience, learning, and intergenerational transmission, has demonstrated the ability to deal with complexity and uncertainty (Berkes, 2012). Incorporating a LK base into tourism management may increase flexibility within systems, and provide effective time-tested strategies in the face of inevitable change.

#### **2.7.4 Applying Local Knowledge**

Standard guidelines for LK application do not exist, in part because of diversity of circumstances with which planners and managers must cope. Application of LK exemplifies a participatory approach to management. Participatory approaches encourage experimentation, innovation, and learning among all representatives enhancing the potential for adaptive co-management. “Participatory research drawing on mixed methods, engages local stakeholders as co-researchers, and aims to produce collaborative relationships, increasing potential for mutual understanding among community members and researchers” (Flint et al., 2011:201). As Failing (2007)

argues, science and local knowledge are critical in decision making around management. Woo et al., (2007) identify the importance of LK as a source of local-scale expertise concerning regional landscapes and climate systems with respect to planning. Moreover, the literature suggests, by combining scientific and LK monitoring methods, local and indigenous wildlife users can scrutinize scientific predictions on their own terms, increasing the likelihood that they will trust and respond to science (Moller et al., 2004). Pierotti and Wildcat (2000:1339) elaborate on this: “[multidisciplinary structures inherent in LK make it relatively simple for knowledge and insights gained through LK to be communicated among members of different disciplines, leading various stakeholders to negotiate more effectively with one another through a shared conceptual framework.” For sustainable tourism management, this is crucial. Active participation in decision-making permits greater understanding of process, increased likelihood of future participation, and long-term sustainable decisions (André et al., 2006). Capacity building measures may encourage more people to actively participate in processes relevant to their community (Hoehn and Thapa, 2009). For management of resources, tourism-based or other, this is vital for prosperity in challenging economic, environmental and often remote locations. Local facilitators in isolated regions provide beneficial attributes including: reduced required expenditures, local enforcement, local employment opportunities, local decision-making, and therefore greater potential for sustainability.

Educational opportunities also result from integration of LK. True cross-cultural learning challenges perceptions, and ideologies challenge rethinking of ideas and actions, encouraging shifts beyond regular cultural norms. These may result in new

insights and innovations (Lertzman, 2010). In turn, this increases awareness, promotes greater acceptance of ideologies, and encourages future integration of multiple knowledge sources. Finally, Flint et al., (2011) and Pierotti and Wildcat (2000) point out that highlighting local voices gives frequently marginalized groups chances to express values, concerns, and ways of knowing. Consulting with holders of LK can generate new and unexpected insights for researchers.

Many examples of people sustainably managing their local resources exist. In some cultures protection of specific species is regularly practiced, be it for medicinal purposes, spirituality, ritual, taboo, or recognition of poisonous attributes (Berkes et al., 2000; Moller et al., 2004; Turner et al., 2000). Meteorological, hydrological and seasonal availabilities also influence LK management of resources in some cases. LK demonstrates examples of resource rotation through ecological indicators and temporal harvest restrictions due to varied environmental conditions. These examples of resource management practiced through LK provide clear evidence of the sustainable, holistic nature of LK. Despite these positive models of management, there are limitations and challenges with application of LK.

#### **2.7.5 Local Knowledge Challenges Beyond Terminology and Misunderstanding**

Beyond extensive issues surrounding LK terminology, now largely overcome through the works of Berkes (2012) and others, other issues exist and require mention. With cross-cultural communication, language barriers exist (Ellis, 2005). Cultural and language barriers present obstacles to collaboration, and differing cultural norms and values also pose challenges (Mason et al., 2012). These difficulties can be overcome

through establishing positive relationships (Wolfe et al., 2007), which however take time and financial resources. Conversely, Danielsen et al., (2014) in a study assessing local knowledge and focus groups, found accessing LK eight times cheaper than ‘conventional’ scientific study methods. Teixeira et al. (2013), conclude similar results indicating that LK is a cost-effective source of knowledge, accurate for large-scale study.

Despite growing appreciation for LK, many researchers remain skeptical about its merits and claims of community empowerment. Unfamiliarity and lack of comfort among scholars, and fears of diluting scientific rigor in favor of political correctness, may lead to integration apprehension (Huntington, 2000). Warwick (2010) considers whether separating unreliable knowledge from reliable LK is worth the time. “The generation, accumulation, and transmission of LK proceeds along very different lines than those in scientific study”, therefore knowledge credibility is questionable (Berkes, 2000:1256). Others also express concern because in some cases, LK and scientific knowledge do not agree and result in differing conclusions (Huntington, 2000, 2011). In short, consensus is still lacking among scientists on whether LK can be adopted into the realm of science (Berkes et al., 2000). Tensions between LK holders and scientists are evident, and power struggles may exist (Bohensky and Maru, 2011; Nadasdy, 2013). Trant et al., (2012:240) reinforce these tensions as they state, “[s]cience by nature places numerical accuracy and precision on field measurements and analysis, greatly different from LK.” The application or integration of LK into research, planning and policy often occurs along an alternative trajectory, and too often it is dissociated from formal science, rather than an integral component of the research process.” (Wolfe

et al., 2007:79). Some argue integration of LK has become a fashionable trend that will pass, consequently they question long-term efficacy of LK if this is the case (Bohensky and Maru, 2011). LK use has frequently been taken out of context with selected ideas withdrawn to suit necessary intentions (Stevenson, 2005). Proponents of LK object to misuse of their knowledge, and the typical compartmentalization that occurs in standard scientific formats; completely contrary to holistic LK ideologies (Nadasdy, 2013). More concrete limitations may also impede implementation. Integration of local communities in management projects is challenging because locals may lack necessary technical and administrative knowledge (Hoehn and Thapa, 2009).

LK is being lost through natural attrition since holders of LK are frequently community elders (Gómez-Baggethun et al., 2010). According to the WWF (2001:1), “[i]n one century, the world has lost about 600 languages. Today, half of the approximately 6000 remaining languages are either extinct or highly threatened, and at current rates, 90% will be lost by the end of 20<sup>st</sup> century.” Other contributing factors to declining LK include: tendencies for more formal education of youth, loss of traditional subsistence practices, new political preferences, adoption of Christianity, and abandonment of traditional cultural practices and ideologies. Cultures globally are moving toward market-based economies, opting to shift away from traditional subsistence practices and associated traditional and local knowledge (Gómez-Baggethun et al., 2010; Phuthego and Chanda, 2004; Turner and Turner, 2008; Turner et al., 2000). Outside influences are increasingly imposing significant pressures on local cultures (Hoehn and Thapa, 2009). Despite the above-mentioned challenges, Bohensky and Maru (2011) conclude that, differences between LK and scientific knowledge do



not impede integration when integration is actively sought. Indeed many of the previously noted facts illustrate the necessity for increased urgency to access LEK holders and to integrate their knowledge, experiences and perceptions into management and planning.

In a growing body of successful cases that encourage integration, both LK holders and scientists indicate positive interactions and outcomes. Fernandez-Gimenez et al. (2007:313) in their research explain that, “native researchers found value in science, incorporating it into their own knowledge systems, and contributing to its success when they shared control of the research agenda process. Similarly, when scientists worked shoulder to shoulder with hunters doing research and participating in village life, their understanding of the potential impacts of their work grew, as did their appreciation of the knowledge and skills of native researchers”. These mutual benefits are positive for improving sustainable outcomes and preserving traditional ways of life. Bohensky and Maru (2011:4) further argue that LK use is “imperative for maintaining global cultural diversity and the biological diversity with which it is intricately connected.”

Local knowledge has successfully been accessed and implemented in many areas including: environmental assessment (Coombes et al., 2011; Ellis, 2005; Failing et al., 2007; Gibson, 2005; Noble, 2010; Tsuji and Ho, 2002; Usher, 2000; Wolfe et al., 2007), forestry (Mason et al., 2012; Stevenson, 2005; and Wyatt et al., 2013), and fisheries research (Beaudreau and Levin, 2014; Budi Utomo, 2010; Dale and Armitage, 2011; Fernandez-Gimenez et al., 2007; Hall and Close, 2007; Hoehn and Thapa, 2009; Hoeppe, 2007; Johannes and Neis, 2007; Kalanda-Sabola et al., 2007; Lauer and

Aswani, 2010; Léopold et al., 2008; McDonald, 1988; Murray, 2011; Neis et al., 1999; Phillipson and Symes, 2013; Pinkerton, 1990; Rasalato et al., 2010; Stoffle and Minnis, 2007; and Thornton and Scheer, 2012). These studies provide positive lessons for integration of LK into management. Common conclusions indicate that respect for different types of knowledge is improving, but trust in these types of knowledge may not be (Dale and Armitage, 2011). Moreover, “respectful partnerships are needed to move beyond legacies of prejudice and misunderstanding to discover new opportunities for cross-cultural knowledge sharing” (Mason et al., 2012:189). Finally, developed partnerships improve relationships, interdisciplinary understanding, cross-cultural appreciation, local co-adaptive management measures and greater public participation, all favorable outcomes for sustainable tourism management.

### **2.7.6 Local Knowledge in Sustainable Tourism, Parks and Protected Areas**

The future of LK use in tourism management appears both positive and negative. If rural, peripheral, and traditional cultures continue to decline globally, LK will diminish accordingly. This knowledge source having developed over significant temporal periods is irreplaceable. LK provides holistic ecosystem-based data sets that extend temporally and spatially further than scientific studies permit in some circumstances. As Turner and Turner (2008) point out, LK and cultural practices are declining in many parts of the world. This will result in loss of LK while contributing to efforts to preserve any remaining LK. Tourism planning and development can foster biodiversity preservation and in many cases, strengthen cultural conservation. Gomez-Baggethun et al. (2010) recognize that environmental policy is probably one of the few

ways to protect remaining LK ‘pools’ in the developed world. Environmental policy includes resource protection so in essence, LK aids in establishing and managing resources while the protected areas established in collaboration with LK holders aid in conserving cultural knowledge. Gomez-Baggethun et al. (2010) continue clarifying this notion, “confirming LK as a valid tool in management and the decision making process will aid in ensuring LK sustainability (Gómez-Baggethun et al., 2010:728).

Confirmation that LK is a valuable tool is now widespread, as numerous successful integration examples illustrate this. For tourism planning and development, consultation with locals is a necessary step.

Given the potential importance of marine protected areas (MPA’s) to long-term sustainability of fisheries resources and Bahamian recreational angling tourism, examining LK application in parks and protected areas is a logical course. “By global mandate, protected areas are now supposed to do far more than conserve biological biodiversity. These areas are charged with improving social welfare, guarding local security, and improving economic benefits across multiple scales.” (Naughton-Treves et al., 2005:239). It has been noted, that lands managed by aboriginal and or local peoples have maintained higher levels of biodiversity, a result of necessity where over exploitation may lead to system collapse and related cultural decline (Dietz et al., 2003). Naughton-Treves et al. (2005:244) note that, “although the explicit interest of indigenous peoples is not biodiversity conservation per se, the coincidence of interest between indigenous people and conservationists, especially given large-scale external threats, is high, even though critics of such alliances abound...both sides have far more to gain working jointly, especially recognizing that the greatest threats to both

indigenous territories and protected areas are from mineral and energy exploration, and large-scale infrastructure developments”. This ‘explicit interest’ is fundamental for LK since conservation of local ecosystems is in the best interest of local people. These are positive goals for planning and management of parks and protected areas and ideologies that have successfully been adopted in park planning around the globe, including MPA development and management (Hunn et al., 2003; Naughton-Treves et al., 2005). Integration of local knowledge proponents and LK into decision-making has resulted in co-operative involvement in park planning and management, participation in landscape planning and protected areas network planning, park interpretation and tourism ventures, capacity building, and the establishment of parks as cultural learning opportunities. Each of these elements has been proven valuable in bridging cross-cultural gaps and achieving positive local participation in the processes. From an MPA or fisheries perspective LK is similarly vital, and frequently follows an ecosystem approach to management (Olsson and Folke, 2001). However, LK is still frequently overshadowed by ‘western’ science. Ames (1998:184) illustrates this nicely stating,

“Indigenous fisherman’s knowledge often gets dismissed for being subjective, anecdotal, and of little value to today’s fisheries and centralized management strategies. Fishermen have spent much of their lives accumulating intimate, fine-scaled ecological information that is not otherwise available.... Fishermen and their subjective anecdotal descriptions have pivotal roles to play in the development and function of sustainable fisheries....Whether fisherman’s knowledge gets integrated into mainstream science to influence management, ultimately depends on ways it is used. Fishermen are, in fact the only available source of local, historical, place-based fisheries information. Just to survive, let alone succeed, each fisherman has been proficient at figuring how local changes in fish stocks affect distribution and abundance. This creates a pool of people with unique experiences about local marine ecology.”

Moreover as explained, the majority of declining ecosystems appear to exist in ‘data-poor’ regions lending to a greater need for local knowledge as sources of indicator

long-term environmental changes (Beaudreau and Levin, 2014; Pederson and Hall-Arber, 1999). Successive generations establish angling patterns based on their current environmental conditions (Ames, 1998). Inter-generational variability results in ‘shifting baseline syndrome’ (Beaudreau and Levin, 2014; Bunce et al., 2008, Pauly, 1995), which at high levels of granularity illustrate environmental changes, potentially unavailable from other sources. Scale and inabilities to quantify anecdotal information result in continued debate around appropriate application. Fine-scaled temporal data may be misleading due to a shifting baseline syndrome yet spatially, fishers’ LK is frequently highly developed (Butler et al., 2012). Despite limitations, literature suggests LK on fish habits and habitats is unparalleled, requiring access and employment (Bergmann et al., 2004: Bonny and Berkes, 2009: Herbst and Hanazaki, 2014: Hind, 2014a, b: Johannes, 2000: Pederson and Hall-Arber, 1999). This knowledge can aid in the establishment of baselines on which environmental changes can be measured.

## **2.8 Host Perspectives on Sustainable Tourism**

Consultation with tourism hosts can provide local knowledge potentially useful for managing tourism resources. According to Wight (1998:75), the keys to sustainable development and sustainable tourism lie in seeking “a more productive and a harmonious relationship with and between the three elements: visitor, host community and environment.” In a 2012-literature review on the social impacts of tourism, Deery et al., (2012:64) stated, “the importance of researching the social impacts of tourism cannot be overestimated. It is crucial for industry, government tourism departments and agencies, to understand how individuals within a host community as well as the host

community overall, perceive the benefits and disadvantages of tourism because of the potential hostile responses to tourism if a balance is not achieved.” Indeed, tourism ventures largely rely on host happiness, willingness to participate, and their attitudes toward related developments. Related literature by Snaith and Haley (1999:597) echo this, identifying happy hosts as essential to sustainability of a tourism sector, relying on the “goodwill of local residents.” A variety of study foci have been addressed in tourism literature concentrating on hosts, including, Swain (1995) examining gender issues in hosts’ perceptions, Erisman (1983), Mansperger (1995) and Stronza (2001) scrutinizing economics and wealth stratification as motivations for participation, while Crick (1989) and Rossel (1988), addressed social and cultural declines resulting from tourist contacts with host communities. Many have studied the commodification of culture or acculturation, the process of cultural and psychological shifts that result from contacts between cultures (McLaren, 1997; Rossel, 1988; and Seiler-Baldinger, 1988). An overarching concern among scholars is that hosts as a result of acculturation may lose their culture, alter traditional cultural practices to suit tourist perceptions and demands, or create a state of cultural dependency (Stronza, 2001:270). MacCannell’s (1973) conceptualization theory of staged authenticity, examines hosts who stage their culture and communities in response to touristic expectations to create a sense of cultural authenticity, a form of acculturation. Despite studies noting tourism drawbacks towards hosts, some scholars have concluded that tourism can help people maintain their cultural identity. This appears particularly valid in cases where tourism venues are reliant on unique host attributes, like traditional Inuit communities in the far north of Canada (Mansperger, 1995). Nash (1981:462) proposed the idea that while local

communities are unavoidably impacted by tourism, those same communities “may play a significant role in determining the kind of tourists it receives, and the form of tourism they practice.” Stronza (2001:268) explains this tourism host paradigm clearly stating, “anthropologists have conceptualized tourism as determining the fate of hosts in many ways, such as whether they will develop economically or not, whether they will feel pride or shame about themselves and their traditions, or whether they will have incentives to protect or destroy their environment.”

Central to the study of tourism hosts are their perceptions towards tourism. If local communities sense negative social, economic or environmental issues from tourism, and that drawbacks exceed potential benefits, hosts may withdraw from tourism, thereby endangering current and future initiatives (Lawson et al., 1998; Sharpley, 2014). Several studies have illustrated that support from local communities for tourism ventures is directly related to their degree of profit, financial or other (Allen et al., 1993; Clements et al., 1993; Johnson et al., 1994; Ritchie, 1993; Easterling, 2004). Perhaps one of the earliest scholars to assess and model host perceptions towards tourism was Doxey’s (1975) tourist irritation index identifying four stages or typologies of ‘irritation’, from euphoria, to apathy, followed by annoyance and finally an antagonism phase. Notwithstanding these studies, Sharpley (2014:37) argues that, “despite the significant volume and increasing scope of the research, the extent to which understanding of residences’ perceptions of tourism has been enhanced remains uncertain”. This pivotal review concludes that several gaps prevail in the study of host perceptions or attitudes towards tourism, namely the prevalence of quantitative studies, and the lack of qualitative based research. Sharpley’s (2014) literature review of over

60 papers reveals only two studies that employed a qualitative methodology. Deery et al. (2012:64) echo this conclusion stating, “the predominance of quantitative methods potentially limits our ability to gain a more in-depth understanding of tourism impacts and how they influence host communities interests.” They conclude in their examinations of related studies that a “new research agenda” is warranted, focusing on qualitative analysis of social impacts on hosts (Deery et al., 2012). Much earlier, Kensit (2000:104) recognized that qualitative studies would facilitate a greater understanding of impacts affecting host communities, identifying critical incident techniques, ethnography, interviews, metaphorical analysis, narratological approaches, semiotics, and storytelling, as underutilized methods in social impact research. Tucker et al. (1990) argued qualitative models permit greater depth of study, adaptiveness, and realism. The significant lapse of time with similar issues still existing in the body of literature, illustrates justification and rationale for the qualitative approach utilized in this dissertation.

In addition to the need to apply more qualitative analysis to the realm of host perception studies, both Deery et al. (2012) and Sharpley (2014) in their literature reviews, identify other gaps in the literature. Case studies appear to dominate the existing literature, but Stronza (2001) argues models or analytical frameworks in which to examine these case studies remain underdeveloped. Additionally, tourism case studies suffer the problem of “reversed causality” whereby a direction of cause-and-effect is contrary to a common presumption or to a two-way relationship ultimately creating a casual loop. The example provided by Stronza (2001:269) illustrates this point stating that, “although tourism may cause increased wealth stratification in some



communities, perhaps people who live in places where wealth differences are already marked are somehow more likely to become involved in tourism.” Other issues facing tourism case studies include the fact that study destinations appear localized to North America, are focused extensively on developed countries, and domestic tourism within those countries. Finally, there appears to be a tendency for studies to remain largely theoretical in nature (Sharpley, 2014). This dissertation however, focuses on anthropological ethnographic investigations, which as previously noted are notably absent in the literature.

## **2.9 Gaps in the Literature**

Several conclusions can be drawn from this literature review. Tourism is rapidly growing and it results in both positive and negative impacts. As a result of less desirable tourism outcomes primarily influenced by large-scale, first-generation, mass tourism venues, sustainable tourism planning and initiatives have become widespread. The effect of significant growth in sustainable tourism reduces the potential for sustainability hence responsible tourism initiatives have developed. Either way, shifts in mass tourism are required to better balance the needs of tourists and local hosts. Additionally, balancing social, economic and environmental priorities is imperative for long-term sustainability of any tourism destination.

Tourism hosts as LK holders are important to consult with, yet little research has been done specifically examining tourism hosts as local knowledge holders. This dissertation examines tourism hosts as LK holders applying a qualitative methodology in a Caribbean island destination, to examine a recreational fishery. As such it helps to

address case-study gaps namely that; 1) sustainable tourism research focused on LK pertaining to resources and associated management practices is limited, 2) the integration of LK in sustainable resource management practices requires continued research, 3) recreational fishing as a form of sustainable tourism activities needs to be assessed from the perspective of the hosts (in this case, angling guides), and 4) host perspectives on ST tend to be dominated by quantitative research, while this study works to reduce this trend.

Conceptually (See Figure 3), the literature themes examined in this study provide background to the many scholarly disciplines that are merged through this research such as sustainable tourism, sustainable tourism, ecotourism, recreational angling, resource management, fisheries management, local ecological knowledge, ethnography and anthropology. Gaps in the literature were identified, and scholarly contributions revealed. Tourism, sustainable tourism and host perceptions to tourism form the foundation of this study. A qualitative analysis was employed in a Bahamian case-study with outcomes that reinforce the significance of consulting with local actors (guides)/stakeholders along with the accessing local knowledge, and of the importance of including locals in decision making. Use of the term “stakeholders” will be used exclusively moving forward, to include guides and other industry professionals

### **3. Methodology**

#### **3.1 Background**

My initial interest in flyfishing originated in the 1970's through on-water time with my amazing grandfather, searching for Brook Trout in the headwaters of the Saugeen River, in Ontario. Though these occasions and opportunities for angling in general were sparse, as a child I was fortunate to frequently visit Florida during school breaks where a passion for fishing in tropical environments ensued. Merging flyfishing with tropical fish species became a natural course, and my flyfishing in saltwater passion grew. Only partly satiated by infrequent trips to Florida, in June of 2012 an invitation by a friend to fish Bonefish in The Bahamas allowed me to broaden my horizons as both Bonefishing and The Bahamas were foreign to me prior to that time. Travelling to Behring Point, Andros, the self-proclaimed "bonefishing capital of the world", my obsession with The Bahamas it's people, culture and environment, exploded. So enthralled was I by that trip that in November of 2012, I attended the Bonefish and Tarpon Trust Symposium where I met many guides and scientists who focus their research on flats fishing species. This event furthered my interest in the region and local fisheries. Specifically, contact with Mr. P. Smith, lodge owner, guide, passionate, polarizing and visionary Bahamian, president of the BFFIA, and son of the late bonefishing legend, Crazy Charlie Smith, sufficiently piqued my interest such that I left my current employment and returned to pursue a Masters Degree, continuing with a PhD and associated research for this dissertation. It was Mr. P. Smith who encouraged me to undertake this study and his many contacts throughout The Bahamas and with

The University of The Bahamas, Department of Oral History and Tradition, that helped me bridge initial cultural divides.

### **3.2 Research and Methodological Rationale**

This study employs a participatory qualitative assessment of Bahamian flats fishing, from the perspective of Bahamian guides, the holders of local knowledge. In so doing, the sustainability of the tourism-driven fishery is assessed adding to the tourism host perception literature. This chapter examines related methods, examines Bahamian bonefishing, and outlines the specific methodology employed in this study. Details on the study region/islands are provided along with, employed survey questions, the research timeline, sampling methods and interview questions used, and finally interviewee details are delivered.

Recognizing conservation development complexities impacting sustainable tourism initiatives, management techniques centered on participatory research are increasingly being employed in tourism management (Bergold, 2007; Bergold and Thomas, 2012). Within the participatory research umbrella, oral history and ethnographic enquiries are increasingly becoming important in comprehending cultural and environmental complexities (Shopes, 2011). According to Shopes (2011), oral history is defined by key attributes including: interviews, formal recording, historical intent, the understanding that oral histories are acts of memory and therefore subjective in depth inquiries, and finally, foundationally and fundamentally oral in nature, reflecting both conventions and dynamics of spoken languages. These traits are problematic in traditional/normative positivist models given the challenges associated with quantifying knowledge, or memory (Merriam, 1991), the reality that memories are

abstract and may fade, results in shifting baselines (Pauly, 1995; Tesfamichael et al., 2014). Furthermore, attempted translations from qualitative information (memory, expertise and experiences) to quantitative data may alter meaning or lose subjectivity all together (Huntington, 2011). Some scholars argue oral history is simply a means of increasing public participation (Teixeira et al., 2013; Usher, 2000), yet public participation successes vary (André et al., 2006; Arnstein, 1969; Haambiya et al., 2015; Pretty, 1995; Wever et al., 2012). Despite this public participation and local knowledge provide fundamental low resolution/granularity snapshots when considering temporal or spatial changes, especially in regions devoid of associated scientific information/data (Butler et al., 2012).

Documenting oral history, conducting ethnographic studies, consulting with locals, assessing the viability and reliability of guide knowledge, and judging the merits of a participatory research framework to similar recreational fisheries-based industries, are central components of this study. Collaboration with local people is now widely recognized as vital for effective management (Coombes et al., 2011; Ellis, n.d.; Pinkerton, 1990; Tsuji and Ho, 2002; Usher, 2000). As Usher (2000) explains, local people spend more time in their immediate environment, observe changes more readily, and consequently inclusion of this knowledge source through co-management practices is logical. Pinkerton (1990) argues integrative actions are critical for management, only achieved through accumulation and amalgamation of scientific and local or traditional knowledge. Indeed, many studies illustrate the sustainable tendencies of local or traditional knowledge, concluding a natural fit with sustainable practices in management (Berkes et al., 2000; Moller et al., 2004; Olsson and Folke, 2001; Turner

et al., 2000). Moreover, involvement of local people may bridge cultural gaps, it encourages participation, fosters stewardship, and may lead to enhanced decision-making, policy planning, regulation enforcement and future sustainability (Ames, 1998; Teixeira et al., 2013).

However, inclusion of LEK or TEK in the case of indigenous or even local peoples, remains subject to debate in view of unfortified scientific rigor (Failing et al., 2007). Scholars opposing application of TEK or LEK, argue local communities lack sufficient capacity for collaboration (Budi Utomo, 2010; Hoehn and Thapa, 2009), complexity of inclusion supersedes benefits (Huntington, 2000), power struggles challenge equity (Nadasdy, 2013), and alternative expectations, goals and outcomes cloud vision (Wolfe et al., 2007). Nevertheless, hesitancy towards collaboration, and inclusion are waning, as perceptions of scientific credibility are evolving (Failing et al., 2007). Accessing and integrating local knowledge in management has now become mainstream practice along with public consultation, and collaborative interdisciplinary research (Lertzman, 2010).

From a tourism perspective, similar challenges exist (access, integration, interpretation etc.) (Hind, 2014b). Despite shortcomings, substantial research now exists extolling overwhelming complementing philosophies, and significant successes when local knowledge is integrated (Beaudreau and Levin, 2014; Hall and Close, 2007; Kalanda-Sabola et al., 2007; Lauer and Aswani, 2010; Teixeira et al., 2013; Zukowski et al., 2011). Rasalato et al. (2010) indicate local knowledge use in data-poor regions as vital to advancing community-based coastal resource management through inclusion of knowledge concerning critical habitats, and local flora and fauna. Fragmentation of

knowledge sources and insufficient participation form barriers to current research systems (Phillipson and Symes, 2013), therefore emphasizing local knowledge use is necessary.

When examining fisheries, select new fisheries legislation documents highlight merits of public participation and local knowledge integration (Kalanda-Sabola et al., 2007). A comprehensive literature review by Johannes (2000) revealed many studies referencing fishers' knowledge that did prevent, or could have prevented (if accessed and integrated), further fish stock reductions when mainstream science failed to identify issues or provide solutions. Noteworthy is the fact that the majority of fisher knowledge related literature pertains to commercial, or artisanal fisheries, not recreational fisheries, (Hind, 2014b). Unlike commercial fisheries where catch rates are documented, artisanal and recreational fisheries lack comparable data sets (Cooke and Cowx, 2006). As a result, assessing resource health in data-poor and remote areas is challenging. Local knowledge in many cases is the sole source of such information vital for management (Ames, 1998; Benaka, 1999; Bergmann et al., 2004; Butler et al., 2012; Hind, 2014a; Johannes, 2000).

Adopting a qualitative analysis approach and examining angling guide knowledge in a recreational tourism-based fishery helps strengthen local insights and address scholarly gaps noted in the literature.

Researching fisheries through local knowledge and qualitative approaches to documentation, inquiry, and analysis, are widespread (Bergmann et al., 2004; Freire et al., 2012; Hoeppe, 2007; Sigler and Sigler, 1984; Sutinen and Johnston, 2003; Tesfamichael et al., 2014; Zukowski et al., 2011), while others quantify fishers'

knowledge and their memories (Beaudreau and Levin, 2014). Hind (2014a) in a review of fisheries literature employing local knowledge, suggests integration of qualitative and quantitative data, to complement findings and bolster conclusions. Beaudreau and Levin (2014) illustrate application of a mixed methods approach, comparing local knowledge to commercial catch records, concluding significant accuracy in local knowledge when compared to available catch records.

### **3.3 Video Ethnography**

Given the central role of video interviewing as a methodological tool in this research, some background on history and practice of the technique is required. As preeminent Anthropologist Malinowski (1922) explained, Ethnography aims to grasp the native's point of view, relation to life, and to realize his vision of his world. Interviewing in Ethnography, is a form of qualitative analysis combining one-on-one interviews, and immersive observations, with origins in early cultural anthropological investigations (Spradley, 1979). Video interviews evolved as a natural technological progression, with use as early as 1895 in a study by Felix-Louis Regnault (Robbens, 2007). It was not until the 1960's and 70's that the practice became more common through works by Mead (Worth, 1980). Complicated by early technological limitations such as cumbersome equipment, large and heavy batteries, battery recharging challenges, unreliable weather tight housings, and high costs, these deficiencies have been largely overcome, making use of video interviewing a more practical method, especially for qualitative-based studies. Still later, studies by Pink (2013) in visual anthropology, Rose (2001) in visual sociology and Kindon (2003) in digital



ethnography, are seen as pivotal in the integration of such techniques in the field.

Prosser (2012) in Denzin and Lincoln (2012) suggests visual research, including video ethnography, was notably absent from methodological approaches prior to 2002 but shifts to the approach, from purely verbal and textual analysis are evolving.

Methodological absenteeism may in part be due to noted technological confines although added research costs may continue to inhibit adoption of the practice.

As Carpiano (2009) states, video interviews are highly useful in documenting informant knowledge, and interactions between community members. This methodology can more accurately embody a person or culture, eliminating selected sampling challenges associated with photography alone (Goldstein, 2007). Proliferation and widespread access of video usage through smartphone technology, social media platforms like Facebook and Instagram, along with Internet video sharing sites like YouTube or Vimeo, further illustrate relevance of the technique given widespread cultural acceptance and use. Despite these positives, some scholars argue interviewees may embellish in the face of cameras (Gibbs et al., 2002; Rose, 2001). Heider (1976) noted potential methodological limitations, arguing that ethnographic film must be objective and unedited; it should be based on scientific inquiry and ethnographic principles rather than desirable cinematographic outcomes. To help overcome these potential methodological deficiencies, large study sample sizes may overcome these challenges depending on the focus of the study and the interviewees. From the context of this study, common themes and responses originating through video interviews suggested truthful answers were provided during video interviews. Pre-determined

open-ended questions focused on specific ethnographic assessments of tourism sustainability alleviated concerns noted by Heider (1976).

Ethics regulations and knowledge ownership are also both issues to consider when integrating video ethnography. Anonymity through video ethnography is impossible hence the methodology may counter academic institution ethics committees. Prosser (2012) in Denzin and Lincoln (2012) explains that legal issues (such as copyright), and dissemination of visual data are problematic with ethics committees who may have limited knowledge of groundbreaking methodologies including videography. Moreover they explain, because anonymity is central to ethical research, institutions may adopt a “safety first” standpoint when considering video-based visual studies where interviewees could be made identifiable. Interviewees participating in this study waived anonymity rights as required by The University of Waterloo Ethics approval process. This procedure did not appear to hinder participation, and most interviewees opted to provide verbal consent. As Prosser (2012) in Denzin and Lincoln (2012) state, attempts to disguise interviewees without adequate justification can remove the very point of the data along with moral rights of participants wishing to have their voices heard. Indeed as Lemelin et al. (2014) suggest, video interviews can be crucial in establishing rapport, and gaining legitimacy. This was the case in this study where it is conceivable that participant involvement was higher as a result of the inclusion of filming, when interviewees were informed that a repository of videos would be established at University of The Bahamas, Department of Oral History and Tradition. This fact gained legitimacy and because this study aligned with The University of The Bahamas, rapport was presumably pre-established in select cases.

Key informants personally extolled these virtues during interviews. All interviewees were openly pleased to be on film, verbalizing their hope to help contribute to historical preservation of marine heritage in The Bahamas. Only one guide was reluctant to share some details on film, choosing to elaborate on one point after cameras were off. For most elder guides, this study may have provided the only opportunity to be on film they may have ever had and they seemed pleased to have their voices heard and acknowledged.

Knowledge ownership issues are pervasive in TEK and LEK literature, and discourse (Berkes, 2012). Ownership of knowledge must also be considered in the context of video ethnography. While having participants waive ownership to their knowledge is one strategy to overcome this, the issue never fades given the potential for participant misunderstandings of waived rights, and possible reemergence of ownership rights as a result. Additionally, it is conceivable that power imbalances, a result of perceived authoritative positions held by researchers, may lead interviewees to feel obligated to waive rights even when the concept is fully understood. In the context of this study, The University of The Bahamas, Department of Oral History and Tradition will house video interviews and control access to these data beyond this dissertation and associated academic publications stemming from this research. To overcome imaginable knowledge ownership issues, entering a knowledge ownership agreement prior to conducting research may alleviate future challenges.

### **3.4 The Bahamas and Bonefishing**

Despite results achieved by Beaudreau and Levin (2014), small sample sizes and the historical focus of this research dictate a qualitative analysis hence; a qualitative participatory research methodology concentrated on oral histories is used in this study. With any approach, accuracy, and reliability potentially hamper methodology and the dependability and reproducibility of conclusions. The Bahamas bonefishing sector is void of any related study; hence applying and assessing a qualitative participatory methodology will provide practical, empirical and possibly methodological contributions, to future studies in and outside of tourism-specific research.

Bonefish research thus far has largely focused on tag and recapture research and telemetry analysis (for example see Murchie et al., 2015 or Burrell, 2018), short-term catch and release impacts (Adams, 2016; Cooke and Philipp, 2004; Danylchuk et al., 2008; Danylchuk et al., 2007; Guindon, 2011), physiology and DNA analysis (Murchie, 2010; Shultz et al., 2011; Suski et al., 2007; Szekeres et al., 2014), historical population changes, and habitat mapping efforts (Black et al., 2015), with a review of related research by Adams and Cooke in 2015. Historical fisheries population studies in the Florida Keys have employed guide and angler reports (Larkin, 2011; Santos et al., 2017; Freeza and Clem, 2015; Kroloff, 2016). Finally, both Elmer et al., (2017) on recreational fisheries in general, and Adams et al. (2019), on flats fisheries management, conclude a multi-methods approach including the participation of local knowledge holders, is optimal for effective management and conservation of recreational flats fisheries. Noteworthy is the fact that recreational angling in this context is labeled as ecotourism in this recent paper, despite the aforementioned issues

associated with the labeling. Despite all of this research, examining tourism sustainability through hosts/guides in Bahamian bonefishing has remained understudied. A Masters thesis by O'Meara (2015) examined local knowledge holders on Exuma and their conservation ethics, inadvertently identifying some bonefish habitats. Another study by Silvy et al. (2017) focused on Androsian resident perceptions towards illegal fisheries harvests, which gathered interesting perspectives that impact results of this thesis research.

While a growing number of bonefish studies now exist; research from a tourism perspective is sparse and from a guides perspective, non-existent. Moreover, studies on fisheries population dynamics, and habitat changes in The Bahamas have received little attention in the literature and the focus of this thesis helps address these gaps. In The Bahamas, governmentally legislated catch rates are non-existent for recreational bonefishing (FAO, 2016), so accessing local knowledge is vital to examining long-term trends. A study by Smith and Zeller (2013) on recreational angling in The Bahamas concluded that 89% of recreational catches are non-residents, illustrating the importance of recreational angling and tourism.

Research on the inception, development, evolution, and future of this fisheries-based tourism industry are vacant, as are assessments of methodological approaches useful for related study. Sustainability of Bahamas bonefishing is dependent on health of the fishery. Increased understanding of historical processes and changes, promote improved opportunities for sustainability.

Evident from examining relevant literature, a disproportionately low number of fisheries related studies actually employ local knowledge or a qualitative methodology.

Challenges associated with quantifying knowledge may deter use of this approach, yet in examining the sustainability of bonefishing in The Bahamas, a qualitative approach was warranted for several reasons. Firstly, a qualitative research strategy had yet to be employed; hence it was logical to fill this gap. Secondly, small sample sizes on some islands (Bimini, n=4), may have reduced statistical accuracy if quantitative analysis were involved. Thirdly, in The Bahamas oral history is the sole source of historical information for much of the population. Illiteracy during the colonial era was perpetuated by social, racial, and gender class differentiation leaving oral history the sole source of information for the majority of Bahamians (Thompson, 2016). As Thompson (2016) explains,

“in The Bahamas it [oral history], is a very valuable tool because our history, the over the 350 plus past years of permanent settlement in this archipelago in the modern era, has not allowed the bulk of the population to go beyond basic literacy levels for most of that. We are still building on a relatively new foundation of universal access to secondary education, and significant access to tertiary education. What that means is that if one is interested in the evolution of our society, let's say certainly prior to World War II and the decades immediately following the fifties and sixties, you want to be interviewing people who are in their nineties and eighties, seventies, and in the documentary record may not have captured their voices directly. In The Bahamas, I would argue that oral history is a key method for bringing into the light, people of socioeconomic strata who have typically been excluded from the dominant narrative.” (TTN0INT).

Finally, qualitative research approaches help bridge cultural, generational, social and gender gaps. The nature of the information being gathered in this study is delicate, and the informants, in a post-colonial era, are somewhat historically untrusting. Fishers are notoriously guarded in preferred angling locations, so a face-to-face, trust building approach, arguably resulted in more truthfulness and subsequent accuracy.

### 3.4.1 Bonefish Background

Bonefish (see figure 1) (*Albula spp.*) have become economically vital components of shallow water neritic tropical angling tourism destinations worldwide. These fish support economically critical fisheries in the Caribbean including most notably: The Bahamas, Cuba, Mexico, Belize, and South Florida. Beyond the Caribbean, *Albula spp.* are found throughout The Pacific (e.g. Hawaii and Christmas Island), as well as The Indian Ocean (e.g. The Seychelles). Eight sub species of *Albula* exist globally (Colborn et al., 2001) and knowledge of their biology is largely a result of impetuous originating from recreational angling resource management efforts funded through NGO's like BTT and the FCF.

Bonefish broadcast spawn in deep water agregations in the spring and fall, coinciding with full moon lunar periods, and they are listed as near threatened by the IUCN (Adams et al., 2012). Their larvae (*leptocephalus*) are pushed through currents and tidal action to shallow marine intertidal zones where they evolve into juvenile bonefish. Bonefish growth rates and age appear regionally varied (Burger, 1974; Crabtree et al., 1996; Wallace et al., 2008). Their diet is likewise varied, they forage on available marine worms, crustaceans, molluscs and small fish. Their preferred habitat is tropical intertidal zones on shallow marine “flats”, and their ranges are generally small (Murchie et al., 2015). This makes bonefish particularly susceptible to localized environmental degradation and point source pollution.

Preference for shallow water makes bonefish susceptible to “sight fishing” opportunities by anglers, targeting them for their high metabolism and associated rapid

swimming speeds. They are known as the “Ghost of the Flats (Brown, 2008), for their ability to reflect light off their scales making them challenging to locate even in shallow clear water. Guide expertise, keen eyesight, and in-depth awareness of the movements of the fish make local guides invaluable in the search for these fish.

### **3.4.2 Recreational Angling for Bonefish in The Bahamas**

Recreational anglers in The Bahamas historically utilized bait-fishing techniques to catch bonefish but since the 1990’s boom in flyfishing, according to guides, the majority of anglers opt to fly fish. Flyfishing is a minor component of the larger global recreational angling industry, however the sector has important economic implications for flyfishing-based tourism destinations. According to the Outdoor Foundation (2018) special report on the state of recreational angling, flyfishing represents just 2.3% of the US recreational angling population, but as a sector of the greater fishing industry, it experienced the highest rate of new participants. 14.7% of fly fishing participants in the US were new to the sport in 2017 and the South Atlantic region (including Florida, where in the southern extent of the state, recreational bonefishing can be conducted). This area accounts for that largest portion of the US total at 19.7% of the whole (Outdoor Foundation, 2018). Fly anglers are notably the most highly educated anglers (Outdoor Foundation, 2018) a finding consistent with Fedler (2010 and 2018), and they possess more economic wealth than on average. Southwick et al. (2016), concluded that flats anglers to The Bahamas, are 94% male, 85% originated from the US and 91% state they would not travel if they could not fish.



### 3.4.3 Bonefishing Tourism

Bonefish (*Albula vulpes*) have been important local fare for centuries in the Bahamas according to the archaeological record (Sinelli, 2010), and oral tradition. In recent years, their importance has been magnified through tourism. Angling for bonefish is conducted extensively throughout the shallow flats of The Bahamas. Indeed, Christopher Columbus apparently renamed the Bahamian Islands “Baja Mar”, meaning “shallow sea”, a reflection of the extensive “flats” surrounding the Bahamas (Vletas & Vletas, 1999). When bonefishing, local guides are sought for their extensive local knowledge on tides, seasonal migrations, water temperature fluctuations, food availability and a host of other variables affecting fish movements. Early guides were local Bahamians familiar with hand lining or netting bonefish (‘haulin’) for subsistence purposes, and they had keen abilities to see these fish. Family Island residents, proficient in catching bonefish, quickly became full time “guides” for recreational angling tourists. Guiding for bonefish today is a highly lucrative source of income, offering opportunities where little else is available. With an annual GDP of US \$20 000 in the Bahamas, or a weekly income of about \$380 (World Bank, 2012), daily angling guide rates of \$275 plus a \$100 tip equate to weekly incomes of \$1875, significantly higher than average income (Glinton, 2014; Rolle, 2014; Smith, 2013; Tate, 2014). Guiding positions are highly valued and grassroots organizations like the Bahamas Fly Fishing Industry Association (BFFIA), the Bahamas Sport Fishing Conservation Association (BSFA), and the Abaco Fly Fishing Guides Association (AFFGA), originated in part, to provide a guiding certification program for skills standardization. These organizations offer professional guiding services and help protect valuable local

marine resources vital for the tourism industry. These non-governmental organizations (NGO's) are key stakeholders in conservation measures benefitting the industry, although benefits arguably affect only a few of the many Bahamians (BFFIA, 2014; BSCA, 2014). Non-native NGO's including Bonefish and Tarpon Trust (BTT), the Fisheries Conservation Foundation (FCF), and The Nature Conservancy (TNC) also work to conserve Bonefish habitat for the industry.

Unlike conventional mass tourism, small lodges accommodating up to 12 anglers typify this industry. Angling lodges cater to high spending, up market clientele in a lucrative, low-density periphery-based niche tourism model. As noted, most anglers originate from the US, are male, exhibit higher education and income levels than average, and are vastly different racially, educationally, and economically from most Bahamians (Bahamas, 2010; Fedler, 2010, 2018; Southwick et al., 2016). Lodges provide employment opportunities to local citizens in the form of angling guides, maintenance workers, boat mechanics, as well as culinary and housecleaning services. The economic impact of this high-value form of tourism is substantial, yet highly concentrated. On some Bahamian islands like Andros, up to 80% of the population is reportedly employed through this industry although proportional influence on most islands is much less (Fedler, 2010). Local market-based economies typical to many tourism destinations are not in place in this industry leaving locals not associated directly with the industry, potentially polarized as a result of economic exclusion and diverging priorities. Numerous untapped opportunities exist for entrepreneurial locals not involved in the Bahamas Bonefishing Industry (BBI) to capitalize on the industry through secondary or even tertiary enterprise.

Historically lodges have been foreign owned, which is primarily a function of wealth distribution and Bahamian history. However, through guiding opportunities and entrepreneurialism, a growing number of successful Bahamian guides are developing their own lodge businesses. Some of these include Grand Bahama Bonefishing on Grand Bahama, Big Charlie's Lodge on Andros, Two Boys Inn on Andros, Swains Cay Resort on Mangrove Cay, Pleasant Bay Bonefish Lodge in South Andros, or the Andros Island Bonefishing Club, among others. Repeat clientele are critical in either model, comprising upwards of 90% of business, and well established, long-time guides have wait lists for their services during peak angling times (Glinton, 2014; Leadon, 2014; Rolle, 2014; Smith, 2013). Legendary guides now pass their knowledge and trade on to their children fostering a "family tradition", while illustrating temporal importance of the industry. Family names like Smith, Pinder, Leadon, Neymour, Rolle or Moxie are synonymous with guiding excellence.

#### **3.4.4 The Bahamian Bonefishing Industry**

Participating anglers access a unique resource (bonefish), practice catch and release, and help fund conservation projects to preserve the fishery through donation to NGO's namely BTT and FCF, as well as angling tournaments. Bonefishing tourism provides tremendous economic advantage to select Family Island communities like guides and lodges. These benefits far exceed the opportunities available through artisanal or even commercial netting of bonefish. Consequently, the state has implemented special regulations for Bonefish. Across the Bahamas, it is illegal to net Bonefish or sell them for commercial gain (Bahamas, 2012). Regulations however do

not ensure compliance, and given the geographical extent of the Bahamas, enforcement of such fisheries regulations is virtually impossible. Ethical behaviors premised on resource protection are profound within the industry; guides and anglers illustrate a stewardship zeitgeist, countering traditional artisanal angling still practiced by many Bahamians for subsistence. Although the industry itself appears to be a ‘win-win’ scenario of sustainable fisheries use, many Bahamians are excluded, access to resources are inequitable, conservation initiatives are biased towards the BBI, and financial leakages are very high. In the Bahamas, tourism leakages are as high as 90% (Fedler, 2010). Consequently the BBI may not be as ‘sustainable’ and beneficial to the islands as portrayed. For the most part, wealthy American anglers have dictated the generation of protected areas, funded research through donation, and promoted angler education for angling best practice, all while leakages occur at alarming rates, local citizens are excluded from traditional fishing grounds and a select few Bahamians potentially benefit.

### **3.4.5 Stakeholders in the Bahamian Bonefishing Tourism Industry**

Accommodating the needs of multiple stakeholders is challenging, if not impossible. Frequently regarded as a “social equalizer”, tourism realistically results in social inequities (Patterson & Rodriguez, 2003). The BBI is no exception to this, with travelling anglers, travel companies, lodge owners (foreign and local), local guides, local citizens, local and international NGO’s, educational institutions, and government departments all potential decision-makers with dissimilar motivations. Ergo, the BBI has been largely unregulated, unidirectional, and for the most part inert in terms of

environmental degradation owing to proportionately low visitor numbers and stewardship ideologies implicit in the clientele. However as growth occurs, entrepreneurs inevitably establish new guiding ventures, clear land for new lodges, and place greater stress on fragile environments.

Tourism in the Bahamas is paramount; the Ministry of Tourism is vital to prosperity, and they hold significant influence in decision-making. However, there are allegations of widespread corruption within government and the tourism ministry (Foundation, 2013). The Ministry of the Environment (agriculture and marine resources), plays a role in management around coastal developments in the Bahamas (associated with tourism and other), yet appears to possess less sway in decision-making than the Ministry of Tourism, given the economic vitality of the tourism sector. Small-scale tourism industries like the BBI, while vital for some Bahamians, occupies a proportionally minuscule economic component, hence government recognition of the industry is low (Adams, 2014), and associated protections lacking. As Gössling (2003) notes, development in small island developing states (SIDS) is characterized by enclave tourism where powerful and influential international conglomerates (e.g., airlines, cruise lines, and hotels) determine the direction and the outcomes. Maximizing profit dictates focusing on mass tourism markets, along with foreign investments, and in the Bahamas this is dominated by cruise tourism and resort/casino tourism, not bonefishing. Moreover, decision making according to McElroy and De Albuquerque (2002), often bypasses local authoritative agencies and community opposition groups in SIDS resulting in negative impacts. These tendencies are likely at play in the Bahamas where only superficial governmental support and funding appear channeled to the

industry when compared to other tourism funding. Recent proposed fisheries legislation may change this, the outcome from these is yet to be seen.

The Bahamas National Trust (BNT), established in 1959 through an Act of Parliament, has been instrumental in working to conserve Bahamian natural resources since its inception. Bonefishing sustainability has been a centerpiece in decision-making, given its economic importance, and BNT has worked to establish marine protected areas (MPA's) across the Bahamas (BNT, 2014). In 2012, the "Master Plan for the Bahamas Protected Areas System" was completed in response to the 2008 Caribbean Challenge Initiative (CCI). The CCI facilitated governments across the Caribbean (originally, the Bahamas and one additional country), working to protect and manage sustainable marine and coastal environments. Since its inception, seven other Caribbean nations have signed on to this initiative (BNT, 2014). The Bahamas were set to establish 40 marine protected areas (MPA's) by their 40th anniversary of independence, or 20% of the country protected by 2020. It should be noted according to Stonich (1998), that local stakeholders frequently receive the fewest benefits from tourism with regard to income, patterns of consumption, and food security, while they concomitantly lose entitlements and livelihoods when faced with MPA development. Moreover, effective management of MPA's is "impossible because of the indispensability of integrating different scales of social, cultural and economic aspects and their dynamics into the design, management and evaluation of these areas" (Gössling, 2003, p. 19). This analysis, if accurate, implies that MPA's developed in the Bahamas largely through impetus from the BBI may have adverse impacts upon local

stakeholders while potentially proving unable to bring about positive environmental benefits.

### **3.5 Data Collection, Research Questions, Interview Questions and Ethical Considerations**

Interviews conducted for this dissertation followed a semi-formal, face-to-face format, with preset open-ended questions designed to answer the pre-determined leading interview questions. Interviews were conducted individually with 3 exceptions where 2 guides met and were interviewed together in each of the 3 cases. Inconsistency in this interview format may have altered results, but unexpected circumstances dictated those 3 outcomes. Content from these interviews was included into the overall results although they deviate from the aforementioned methodology. They are included because the content was deemed important, and 5 of these 6 guides can be considered senior/elder guides hence they were able to provide valuable historical contexts.

---

#### **3.5.1 Research Questions**

---

Three primary research questions guide this study:

1. What does guiding mean, what motivates guides to be a guide and what is their view of economic significance of the job?

The following sub-questions were examined to offer detailed insights into the importance of bonefishing tourism to local guides.

- 1.1 What influences encourage guides to enter the profession and what merits (if any) are deemed through guiding that make it a

worthwhile employment opportunity in Bahamian communities?  
Guide motivation

1.2 How important is guiding in The Bahamas, and how has the industry shaped Family Island (FI) communities? Role of guiding for FI communities – economic significance

1.3 How do guides measure their own success as a guide?

2 How do Bahamian angling guides view their resources (e.g. fisheries habitats, population dynamics, conservation strategies, etc.).

The following sub-questions were examined to address the main question:

2.1 - How have contemporary Bonefish (*Albula vulpes*), Tarpon (*Megalops atlanticus*) and Permit (*Trachinotus falcatus*) population dynamics in The Bahamas, (specifically Bimini, Grand Bahama, Abaco, Exuma and Andros), changed over time from the perspective of guides?

2.2 - What changes (ecological or economic, as defined by guides) are affecting the fishery, the industry and local communities?

2.3 – Are identified changes common throughout the study area or are there local variations?

3 How can guide's understanding of contemporary changes in the recreational angling industry inform sustainable resource management policies in The Bahamas?

### **3.5.2 Primary Interview Questions**

In order to address the leading research questions, the following list of interview questions were used. Interview questions were designed to be simple, short, straightforward questions to reduce potential misunderstandings that may have resulted from cross-cultural differentiation, language barriers or other.

1. How long have you been guiding? (motivation)
2. How did you get started in guiding? (motivation)
3. What is important to being a good guide? (skills, attributes)



4. Do you believe guiding has been a good job for you?
5. Do you feel guiding is a good career for young Bahamians?
6. How important is bonefishing and guiding to The Bahamas?
7. How have bonefish populations changed since you began guiding?
8. How have tarpon populations changed since you began guiding?
9. How have permit populations changed since you began guiding?
10. Do you have any concerns about the future of the bonefishing industry in The Bahamas?

Interview questions 1-5 address leading research question 1 and its sub-questions.

Interview questions 6-9 address leading research question 2 and its sub-questions, and interview question 10 addresses research question 3. Interviews were recorded in both audio and video and notes were taken to supplement interview content.

According to Huntington (1998), semi-structured interviews provide flexibility, and they allow interviews to proceed according to the interests and knowledge of interviewees. Consequently, questions about specific events and actions may be extended to maximize information gathering, going beyond pure opinion or generalizations (Maxwell, 2005). This approach was utilized to assess the sustainability of the fishery through guide knowledge. The semiformal approach may have encouraged participation by avoiding cultural incongruences pervasive in a post-colonial setting where racial divides may have impeded participation, collaboration, and sharing. Establishing strong trusting relationships with interviewees was challenging yet important to assure accurate information. Networking through the University of The Bahamas (UOTB), The Bahamas Fly Fishing Industry Association

(BFFIA), the Abaco Fly Fishing Guides Association (AFFGA), tourism companies (like Yellow Dog Fly Fishing or Frontiers International), and angling lodges (like North Riding Point Club- Grand Bahama, The Delphi Club - Abaco, Bair's Lodge – South Andros, Club Peace and Plenty – Exuma, or the Andros Island Bonefishing Lodge – North/Central Andros), helped bridge relationship gaps. Additionally NGO's like Bonefish and Tarpon Trust (BTT), and the Fisheries Conservation Foundation (FCF), who have both previously established solid partnerships on several islands, assisted in making connections. Affiliation with these industry entities accelerated relationship and trust building.

Purposive and snowball sampling were used for recruitment of bonefish guides. Interviewee recruitment was based on formal identification as a bonefish 'guide', through affiliation with a legitimate bonefish lodge, independent recognized/advertising proprietorship, or through membership in the BFFIA. A mixture of sources was used to access guides to reduce potential issues surrounding any one organization and the polarization that is pervasive within the industry (Karrow and Thompson, 2016). Guides of all experience levels were sought. Willingness of guides to participate may have enticed other guides to be interviewed, and results may be biased as a result of like-minded individuals and social guide networks. Guiding models (independent guides, guides exclusive to one lodge, guides working for any lodge) differ between islands, and islands like Abaco have a mix of both models. Guides working through lodges were contacted through the lodge, and independent guides were contacted directly. Some independent guides advertise through local island tourism brochures, some use social media and have websites; others use a combination of methods. Elder

guides, no longer guiding were accessed through family members and or community members as they often hold a prominent role within their communities (e.g. political leaders, business owners, church officials). On Abaco, the Abaco Fly Fishing Guides Association assisted with contacting guides, lodges on Andros provided networking support as did The Bahamas Fly Fishing Industry Association, and on Bimini guides were contacted directly, either through word of mouth (snowball sampling) contacts, advertising, or by simply visiting their house. (On Bimini for example, an historical plaque identifies the home of a senior Bahamian guide.) On Grand Bahama, lodges and snowball sampling helped facilitate contacts with guides and on Exuma, guides were contacted directly through advertisement media and snowball sampling. Industry professionals including Ministry of Tourism officials, University of The Bahamas faculty, and lodge owners, were also consulted through this study but guide interviews constitute the majority of interviews conducted.

By employing semi-structured interviews, guides presumably felt less pressure and were accordingly more willing to share knowledge about the industry, their role in the business, changes they have witnessed, key fisheries habitats they identify, species specific questions for bonefish, tarpon and permit, and concerns they have about the fishery, along with projections for the future they may hope for. Openness of guides varied greatly, and consequently may affect accuracy of results. To avoid these potential inaccuracies, preset structured questions helped ensure consistency between interviews, while providing structure for interviews. Preset interview questions were designed to be open ended to allow for extension of observations, perceptions and theories. Preset questions were designed to be simple for increased comprehension

among interviewees. Preliminary fieldwork with the support of Dr. D. Phillips of the Fisheries Conservation Foundation took place on Grand Bahama in 2015. Dr. Phillips had previously conducted a considerable body of research on the island and had established good relationships with local guides and lodges. As a result of long standing relationships, working with Grand Bahama guides and lodges was simplified and allowed for streamlining of the methodology used on future fieldwork on other islands. Interview questions were adjusted, interview formats were practiced and effective strategies for contacting guides were gathered.

Typically oral histories are open-ended, subjective, historically inflected, and recorded in audio and video formats (Shopes, 2011). Oral historians attempt to seek the natives' point of view (Geertz, 1974), which in this case was angling guides and other industry notables (ministry officials, lodge owners, NGO staff or scholars). This research methodology followed The University of Waterloo ethics protocol and clearance under policy 19800 (See Appendix A, B and C). Interviews were filmed, and notes were taken to supplement interview content. Extracts from interviews are used to illustrate original intent, and are scribed in a format indicative of the Bahamian dialect (e.g. this is dis, with is wit, fishing is fishinen, father is fodder) (See chapters 4, 5, and 6 for extracts from interview transcripts). Although interview extract coding is employed in the results using NVIVO 10 software, anonymity was not assured during interviews. Interviewees were told that they did not have to be filmed, but all interviewees appeared pleased to be given time to share. One individual wanted to provide additional information off camera, after the formal filmed interview concluded. Interviews ranged in duration from 28 minutes to over 2.5 hours. Interviews were conducted between

2015 and 2018 during fieldwork periods focused on summer months when guiding is slower and guides are more readily available. Conflict with an August opening of Lobster season impacted the 2015 field season on Grand Bahama, future fieldwork efforts avoided August for this reason. Two fieldwork sessions deviated from this summer pattern, work on Abaco and a return trip to Andros for reasons noted below.

In August 2015, three weeks of fieldwork on Grand Bahama Island was conducted. This fieldwork as previously stated helped shape the course of this study through collaborating with Dr. D. Phillips. In June of 2016, interviews continued on Grand Bahama (2 weeks) as well as on Bimini (one week). In January 2017, fieldwork on Abaco took place (2 weeks) to coincide with the Abaco Friends of the Environment Conference where results from interview work on Grand Bahama and Bimini was presented. In June and July of 2017, interviews and fieldwork took place on Exuma (two weeks) and Andros (5 weeks) with a follow up fieldwork session (one week) in February of 2018 on Andros to complete interviews of elder guides not possible during the summer of 2017. More time was allocated to Andros Island research as a result of geography and a greater number of guides to be interviewed. Finally, three research sessions took place in Nassau, on New Providence Island. In 2015 interviews with tourism officials were conducted which coincided with the UNWTO conference and later at the Bahamas National Trust (BNT) Conference where initial results were presented. In 2017 more interviews on Nassau took place again coinciding with the BNT conference where more results were presented. Nassau-based interviews excluded angling guides as there is only one, and focused on Ministry of Tourism individuals for background on the fishery.

The number of interviews conducted varied between islands, because the number of guides on each island differs. According to the 2015 Bahamas Fly Fishing Industry Association (BFFIA) membership list provided by The Bahamas Ministry of Tourism, Bimini has zero members, Grand Bahama has 12, Abaco has 19, Exuma has 8 and Andros has 64. Conversely, Fedler (2018) identified Bimini (and the Berry Islands) as having 6 potential guides while Grand Bahama reportedly has 37, Abaco 52, Exuma 10, and Andros 71. He concluded 245 potential guides exist across the whole of The Bahamas with 176 originating from the 5 study islands focused on in this research. Having interviewed 71 guides from these 5 islands, the percentage of guides interviewed using Fedler's (2018) numbers is 40.3%, a statistically high sample. Variability in guide numbers demonstrates some challenges associated with communication and accuracy of information in The Bahamas. Determining who is a guide is not always straightforward; some are part time independent guides, others have retired, both situations complicate access to guides and validation of their status.

Based on personal communications and experience gathered over multiple trips to The Bahamas, including several trips to Family Islands, field-work conducted for this research reveals that Bimini has four guides, Grand Bahama has 20-30, Abaco has 20-30, Exuma has about 10, and Andros has 75-100. These figures predate Fedler (2018) so guide numbers may have increased since fieldwork concluded. Actual numbers of guides on each island are not exact. Not all guides belong to an organization like the BFFIA, not all guides work fulltime, not all guides advertise, not all guides work for a lodge, some guides move from island to island making accurately determining the number of guides challenging, and some guides only guide part time.

For greater accuracy with results, attempts were made to interview at least 50% of the known guides on each island, except for Andros where 20-25% of the guides seemed more realistic given the islands' expansiveness, challenging inter island travel, the reported high number of guides, and the costs associated with these issues.

71 interviewed guides for this study represents 28.9% of the potential guides under this assessment, or 40.3% of the noted guides by Felder (2018). More importantly, results demonstrate congruency in responses thereby justifying the number of interviews conducted for this research.

The 2015 bi-annual meeting of the BFFIA featured elder "honoree" guides identifying one guide on Bimini, one on Grand Bahama, two on Abaco, six on Exuma and 15 on Andros. To develop a lengthy temporal assessment of changes in the Bahamian bonefishing tourism industry, inclusion of these elder guides was a primary goal. On Abaco, Bimini and Grand Bahama, 100% of the noted elder guides were interviewed. On Exuma, only 1 out of 6 was interviewed, the others had passed away since 2015, or had become incapable of being interviewed. On Andros, 12 of 15 BFFIA recognized elder guides were interviewed, 1 had passed away and the other two were ill. (See Table 2).

**Table 2 - Numbers of guides on focus islands according to the BFFIA membership list. Estimates of actual numbers of guides, the number of honouree/elder guides (living and non-living) on each focus island as identified by the 2015 BFFIA annual membership meeting report, and the number of guides actually interviewed.**

| Island       | Number of BFFIA Members | Number of likely guides | No. of honouree/elder guides noted in the 2015 BFFIA Bi-Annual General Meeting Book | No. of deceased honouree/elder guides noted in the 2015 BFFIA Bi-Annual General Meeting Book | Number of guides interviewed on each island | Percentage of interviewed guides, to estimated actual number of guides. |
|--------------|-------------------------|-------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------|
| Abaco        | 19                      | 20-30                   | 2                                                                                   | 0                                                                                            | 12                                          | 40                                                                      |
| Andros       | 64                      | 75-100                  | 15                                                                                  | 21                                                                                           | 33                                          | 33                                                                      |
| Bimini       | 0                       | 4                       | 1                                                                                   | 0                                                                                            | 4                                           | 100                                                                     |
| Grand Bahama | 12                      | 20-30                   | 1                                                                                   | 0                                                                                            | 19                                          | 63                                                                      |
| Exuma        | 8                       | 10                      | 6                                                                                   | 3                                                                                            | 4                                           | 40                                                                      |

Source: Fieldwork, 2015, 2016, 2017 and 2018

### 3.6 Study Area

Geographically, The Bahamas lie to the northeast of the Caribbean in the Atlantic Ocean. The Commonwealth of The Bahamas forms an archipelago in the northeastern Caribbean, off the southeast coast of the continental United States. The nation stretches in excess of 1050 km from Bimini, only 59 nautical miles from Florida, southeastward to the Turks and Caicos Islands. The Tropic of Cancer bisects the island chain, the Great Bahama Bank, on the Island archipelago of Exuma at 23°26'13.2" north of the equator. Proximity to the equator, along with moderating ocean currents, result in a semi-tropical marine climate throughout The Bahamas. As Craton (1986:11) explains, The Bahamas are a collection of “29 islands, 661 Cays (pronounced ‘Keys’), and 2387 rocks.” (See Map 1 and 2).

The Islands of The Bahamas are exposed sections of a greater submarine platform comprised primarily of coral and oolitic limestone sloping eastward into the



Atlantic Ocean (Sealey, 2006). Its terrestrial elevation is greatest on Cat Island at 60m., although most islands have little relief. Oceanic trenches like the Tongue of the Ocean (6100m.) bisect the northwestern archipelago, the Gulfstream Current fringes the western most islands in the chain like Andros and Bimini, and east of The Bahamas is the Atlantic Ocean. Total land area of the country is 13 940 km<sup>2</sup>, while another 130 000 km<sup>2</sup> of shallow submarine banks compose the majority of the country. Intensive erosional processes and sedimentation provide nutrients to rich shallow marine environments (Sealey, 2006). Historical reliance on agriculture (forestry, cotton, pineapple, and sisal) and a maritime economy (Albury, 1975; Craton and Saunders, 1999; Craton and Saunders, 2000; Saunders, 1991; Saunders, 2000) have subsided to one largely based on marine extraction, and tourism (Cleare, 2007; Strachan, 2002). Minor forestry operations still exist on Andros, Abaco and Grand Bahama, while a growing resource extraction industry for aragonite, is relocating sand from The Bahamas to Florida beaches (Sealey, 2006).

Only about 30 of the Bahamian islands are inhabited. The current population of The Bahamas is 397 284, the population density is 40 per km<sup>2</sup>, and 83% of the population is urban (Worldometers, 2017). As of 2015, roughly 274 400 people reside in Nassau, the nation's capital on the island of New Providence, and another 50 000 (as of the year 2000), reside in Freeport on Grand Bahama. The two largest Bahamian population centers comprise 81.6% of the nations' population, leaving 72 884 people dispersed in small communities on the remaining inhabited islands, commonly called "The Family Islands". Family Island terminology refers to Bahamian islands other than New Providence/Nassau or Grand Bahama, the two most populous islands in the

archipelago. The population of The Bahamas is 85% African in decent, 12% European, 3% Asian and Latin American. Afro-Bahamians are the largest ethnic group in the country, accounting for 85% of the population (World Population Review, 2017)

Historically, a white European minority held power during the colonial era, and slavery was practiced widely. Post-colonial Bahamians still suffer economically, socially and culturally from colonial atrocities associated with subjugation (Craton and Saunders, 2000). Black servitude theory, “belief that tourism, in regions such as the Caribbean or South Pacific, is an activity that perpetuates the subjugation of formally colonized or enslaved peoples, for maintenance of the service (black) and served (white) relationship” (Weaver and Lawton, 2002:280, 460), challenges positive tourism service in The Bahamas and the flats fishing industry (Karrow and Thompson, 2016- See Appendix C).

Although The Bahamas is composed of 700 islands, bonefishing tourism is limited to only a few Bahamian islands, a result of inadequate infrastructure and reputation within the wider international angling industry. Anglers seeking to travel to less developed islands may choose ‘do it yourself’ (DIY) angling options (where guides are not employed or available), house rentals, or even remote camping. Of the Bahamian islands commonly visited for recreational angling, Abaco accounts for 75 186 total angler nights, followed by Andros (64 441 total angler nights), Nassau/New Provident (42 756 total angler nights), Eleuthera (42 206 total angler nights), Grand Bahama (35 393 total angler nights), leaving Exuma and other islands (Acklins Island, Crooked Island, Bimini, Cat Island, Mayaguana Island, Inagua Island) drawing about 55 000 total angler nights in 2008 (Fedler, 2010). These data are questionable since as

Fedler (2010 and 2018) explain, anglers may be subject to being counted twice, once when they arrive at the international airport in Nassau and again when they reach their final angling destination. There is little to no bonefishing in Nassau so the reported 42 756 total angler nights in 2008 is invalid. These data are challenged by “the inability to accurately allocate non-guided flats fishing to individual islands... thus the 34 000 non-guiding angling days (included in the Nassau/New Providence figures), quite likely overestimate non-guided nights on Nassau/New Providence, while underestimating non-guided nights on other islands” (Fedler, 2010:12). When focused on guided flats fishing, Abaco and Andros account for 44% of all guided flats fishing in The Bahamas, and the remaining guided fishing days is “distributed relatively evenly” across the other islands (Fedler, 2010). This same study revealed direct expenditures for guided anglers (21% of all flats anglers), totaled \$14.7 million, direct expenditures for non-guided anglers (79% of all flats anglers) contributed another \$55 million, and when a value added multiplier of 1.02 was included, the total economic impact of the flats fishing industry in The Bahamas approached \$141 million (Fedler, 2010). An updated assessment by Fedler (2018) places a value of US \$169 million on the fishery showing a 17% increase or a 1.7% increase year over year. A third economic study by Southwick et al. (2016) evaluating the same fishery concluded that an estimated 36 886 people travel to The Bahamas to fish recreationally on an annual basis (flats fishing and offshore angling). The same study concludes these anglers contributed \$527 million, and \$411 million to the overall country’s GDP. Conversely, the Bahamian commercial fishery is valued at only \$94 million, a fraction of the recreational fisheries (Southwick et al., 2016). Recreational angling in The Bahamas directly employs 18 875 individuals

while the commercial sector accounts for 9 300 positions. Flats fishing specifically, represents \$234.3 of the total, or 45% of all recreational angling in The Bahamas, illustrating the importance of the fishery, and need for sustainability. Upwards of 80% of some island residents (Andros), are employed through bonefishing, directly or indirectly (Fedler, 2010 and 2018). About 85% of recreational anglers travelling to The Bahamas originate from the United States, 7% from Canada, and 7% from elsewhere. Of these anglers, 89% are visitors, and 6% are second homeowners: 94% male, and 90% stating angling as the primary purpose of travel. Importantly, roughly 91% of the anglers participating in the Southwick et al. (2016) survey stated they would not have traveled to The Bahamas if they could not fish.

As mentioned earlier, this study involved five Bahamian Islands, Abaco, Andros, Bimini, Grand Bahama and Exuma. These islands were selected in consultation with Dr. D. Phillips and Dr. A. Adams of The Bonefish and Tarpon Trust, in part because of their reliance on recreational flats fishing and guided angling days, but also because of longevity in the industry. Bonefishing on Bimini began in the 1920's, on Andros in the 1940's, and on Grand Bahama, Abaco and Exuma in the 1950's (Karrow, n.d.). These fisheries are the earliest Bahamian flats fisheries, so it was assumed that a longer historical period of recreational angling might have resulted in more significant impacts potentially affecting sustainability of the fisheries. Tourism impacts are often cumulative in nature (environmental degradation, building densities etc.) (Carlsen, 2016), so examining Bahamian Islands with an older recreational fishery may demonstrate more tourism related impacts.

### 3.6.1 Abaco Island (See Map 3)



Map 3 – Abaco Island Archipelago (Turrell, 2016)

Abaco is located most northeastward in the Bahamian Archipelago. The primary islands of Great Abaco and Little Abaco are sheltered from the Atlantic on the east by barrier islands like Wood Cay, Green Turtle cay, Elbow Cay, and Walkers Cay. Abaco is an archipelago within the Bahamian archipelago. The island chain is 120 miles (193 km.) long and has a population of 13 170 (Bahamas, 2017a.). Traditional economies of marine extraction, boat building and wrecking (salvaging shipwrecks), have declined (Cleare, 2007), and the Abacos now rely primarily on tourism and citrus farming (Bahamas, 2017a.). According to Southwich et al. (2016), Abaco accounts for 36% of travelling recreational anglers (offshore and flats fishing) to The Bahamas. Fedler (2010) concluded US \$20 million in economic revenue is generated through

bonefishing tourism on Abaco. This assessment, establishes Abaco as the second most profitable Family Island from an economic standpoint focused on bonefishing.

To the west of Abaco, lie the “marls”, an expansive undeveloped shallow water area, and further west, lays Grand Bahama. The marls are the primary area of bonefishing on Abaco, although deeper oceanfront flats on the east side of Abaco also provide suitable habitats (Notes, 2016). Abaco has 4 lodges dedicated to bonefishing, roughly 30 full-time bonefish guides, a large rental house market, other non-angling specific accommodation options, and a local guiding association, The Abaco Fly Fishing Guides Association. Due to the economic importance of recreational angling on Abaco, sustainability of local flats fisheries is important.

### **3.6.2 Andros (See Map 4)**



Map 4 – Andros Island (Turrell, 2016)

Andros is the largest island in The Bahamas at 167 km. long by 64km., making it larger in area than all other Bahamian islands combined (Bahamas, 2017a.). It is actually three large islands, North Andros, Mangrove Cay and South Andros, truncated by east to west oriented bights (Sealey, 2006). The Tongue of the Ocean, a deep oceanic trench, separates Andros from New Providence and the Exuma Chain on the east, and the Andros Barrier Reef extends along the eastern coastline over 255 km. The west side of Andros consists of expansive uninhabited shallow water flats, ideal for shallow-water angling, and is now a National Marine Park (Notes, 2016). The population of Andros is about 8000 people (Bahamas, 2017a), all residing on the eastern fringe of the island. A United States Naval base (AUTEC – The Atlantic Undersea Test and Evaluation Center, established in 1959) is the islands’ largest single

employer but tourism accounts for the majority of Androsian GDP (Bahamas, 2017a). Historically scuba diving drew tourists to Small Hope Bay on Andros (Karrow, n.d.). Andros now boasts about a growing ecotourism business focused on diving, birding and bonefishing. Of these, bonefishing has grown exponentially on Andros giving it the title of “Bonefishing Capital of the World” (Brown, 2008).

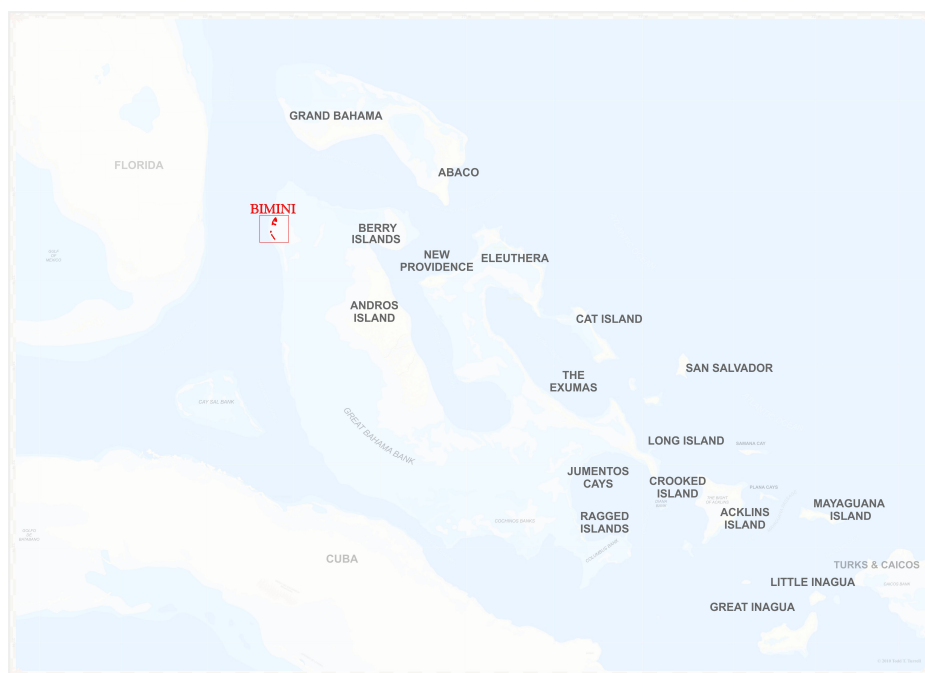
While Southwick et al. (2016) concluded that only 11% of recreational anglers traveling to The Bahamas go to Andros, Fedler (2010) indicated that flats fishing on Andros accounted for \$47 million in 2008, making it the top Bahamian island for revenue generation associated with bonefishing. Fedler (2018) re-issued these figures identifying Andros accounting for \$34.5 million, still the top island destination for bonefishing although an apparent drop of \$12.5 million had occurred. It is probable that this noted decline is more a function of study methodology, participant participation and political ecology than an actual change of that magnitude.

Andros has over 20 lodges dedicated to bonefishing tourism, upwards of 100 bonefish guides, and an extensive house rental market for anglers seeking alternate options. Tourism branding on Andros is frequently connected directly with bonefishing tourism, consistent with individualized island branding noted by Rolle (2015). Moreover, general public awareness of bonefishing on Andros is sufficiently high enough that Hayes et al., (2015) found general perceptions about tourism on Andros as potential drivers of support for marine protection measures associated with the management of bonefishing/tourism related resources. Despite the high number of lodges, bonefish guides, and the lengthy bonefishing industry on Andros, the fishery may be more sustainable than on other Bahamian islands, simply because of its



geographical extent, low population density, and extensive unexplored regions on the west side, now a national marine park with some legislations against development.

### 3.6.3 Bimini (See Map 5).



Map 5 – Bimini (Turrell, 2016)

The island of Bimini lies farthest to the northwest in the Bahamian archipelago, at 59 nautical miles from the continental United States (Craton, 1986). Bimini is actually three islands, South Bimini, North Bimini, and a lesser-known uninhabited East Bimini (Notes, 2015). Close proximity to the Gulf Stream Current established Bimini as a world leading tourism destination for offshore pelagic species in the 1920's, made famous by writings of Ernest Hemmingway, and bonefishing developed shortly after (Karrow, n.d).

Bimini is roughly 11 km long, by 200m., at its widest point. It has a total area of 23 km<sup>2</sup>, and a population of 1717 (2010) (Bahamas, 2017a.). Bimini has a lengthy

history with tourism. The Bimini Bay Rod and Gun Club, established in 1924, is one of the earliest resorts in The Bahamas (Saunders, 2000, 2006). Close proximity to the continental U.S. permitted short trips by sea, prior to regular aviation routes were available. Ready access, a reputation for unparalleled offshore angling, and notoriety by individuals like Hemmingway, quickly attracted tourists to Bimini.

According to Southwick et al. (2016) 21% of recreational anglers travelling to The Bahamas, travel to Bimini. Although not clarified in the report, this high figure is likely offshore anglers and not flats anglers. Fedler (2010 and 2018), lumps Bimini in with “other” islands (Long Island, Acklins Island, Crooked Island, Mayaguana Island), from a bonefishing perspective. Bimini is not a highly sought after bonefishing destination (Davis, 2017). Although many guides worked on Bimini in the past, only 4 Biminits are now bonefish guides. The reduced number of active bonefish guides on Bimini may be a result of significant mass tourism developments on North Bimini, and an associated loss of bonefish habitat.

#### **3.6.4 Grand Bahama (See Map 6)**



Map 6 – Grand Bahama Island (Turrell, 2016)

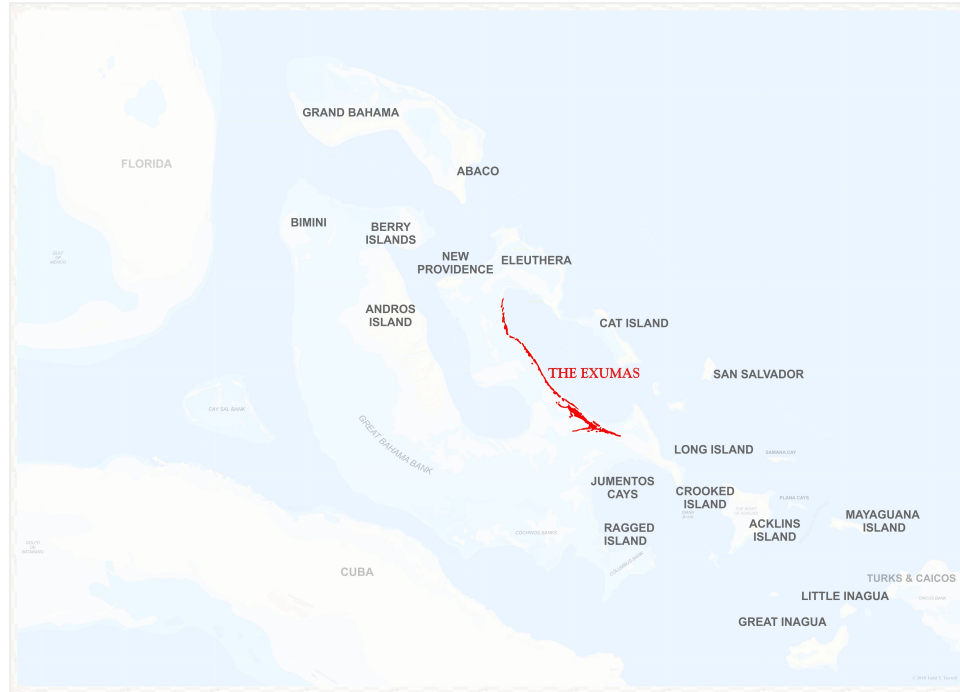
Grand Bahama is the northern most island in the Bahamian archipelago, it is the second most populous Bahamian island at 51 756 (2010), and it is roughly 153 km. long and 24km. wide at its widest point (Bahamas, 2017a.). Apart from Freeport, the largest city and second largest urban center in The Bahamas, the population is scattered in small communities along the south shore (Bahamas, 2017a.).

According to Southwich et al. (2016), Grand Bahama accounts for 30% of recreational anglers traveling to The Bahamas. Like Bimini, this figure may be inflated due to inclusion of offshore angling in the statistic. The south shore of Grand Bahama has immediate access to deep water and the west end of the island is only 86 km. from Palm Beach, Florida. As a result, Floridians spend weekends in West End, Grand Bahama, deep-sea fishing and capitalizing on free trade in Freeport (Notes, 2015). Fedler (2010) concluded the Grand Bahama bonefishing industry generated \$5.4

million in 2008 and \$14 million in 2018 (Fedler, 2018), suggesting the assessment by Southwich et al. (2016) did include offshore angling.

Roughly 30 guides work on Grand Bahama from West End to the eastern end at McLean's Town (and Sweetings Cay) where one of the first bonefish lodges in The Bahamas was established (Deep Water Cay, 1958) (Karrow, n.d.). Three dedicated bonefishing lodges along with several other guiding operations cater to anglers visiting Grand Bahama. With human settlements concentrated along the south coast, and predominantly in the west end, all of the northern coast of Grand Bahama is undeveloped habitat suitable for bonefish. Much of the east end is also largely untouched by impacts associated with anthropocentric development. However, aggregate extraction operations and proposed deep-water ports far from Freeport, now threaten natural habitats and sustainability of the local bonefishing industry. Carnival Cruise lines recently formalized plans for a new cruise terminal at the east end of Grand Bahama (Caribjournal, 2017), inevitably further stressing fragile marine systems that support bonefish.

### 3.6.5 Exuma (See Map 7)



Map 7 – Exuma Island Archipelago (Turrell, 2016)

Like Abaco, Exuma is an archipelago within the larger Bahamian archipelago. The Exuma chain consists of over 365 islands, extends 209 km. north to south, and has a total land area of 187 km<sup>2</sup> (Bahamas, 2017a.). Great and Little Exuma constitute 158 km<sup>2</sup> and 11 km<sup>2</sup> respectively, the population of the whole chain is 6928 (in 2010), of these, 1437 reside in Georgetown, the capital. Direct flight access to Toronto, Canada is considered to be the catalyst for a doubling of the population between 2000 and 2010 (Bahamas, 2017a). The Exumas Land and Sea Park, established in 1958, was the first marine protected area in the world to include terrestrial and marine protection with full no-take restrictions (exumapark.org, 2017).

Exuma had one lodge dedicated to bonefishing that closed in 2010, and less than 10 guides still guide for bonefish on Exuma. According to Southwich et al. (2016),

8% of recreational anglers to The Bahamas travel to Exuma to fish. However, like Bimini and Grand Bahama statistics from the same study, this figure may be inflated because of offshore angling inclusion. Fedler (2010) assessed the Exuma bonefishery at \$3.5 million in 2008, ranking it the lowest in revenue generation from bonefishing not included in the “other” category. Fedler (2018:15) included the Exumas into a category identified as “Other Out Islands”, perhaps because of insignificant economic impacts.

### **3.7 Data Analysis**

Data analyzed for this study are based on 88 interviews conducted during 5 field seasons, (in 2015, 2016, 2017 and 2018). All interviews were transcribed using Transcribe Lite, an online transcription tool. Of the 88 interviews, 71 were conducted with bonefish guides, while the remaining 17 interviews were conducted with various tourism stakeholders including lodge owners, Bahamian Ministry of Tourism Officials, and faculty from the University of The Bahamas. Post transcription, some interviewees who had access to email or social media, were asked to review and verify the content of their interviews. Challenges associated with long-distance communication, cultural disconnect, and scheduling limited the success of this approach. Of the 15 interviewees contacted, two successfully reviewed their transcript and provided comment for clarification. Neither of these individual interviewees are guides. Rate of return may have improved had more guides been accessible via long distance communication or had face-to-face reviews taken place. Time and finances prevented this approach, and ‘island time’ culture may have reduced follow-up responses.

Transcribed interviews were analyzed using NVIVO 10.0 software to assist in key word content analysis. Content analysis, key word coding and open coding, involved the identification of key terms, or key phrases of interest, used to address leading research questions (e.g. bibbling, pollution, hurricane or phrases like bonefish population change, permit population increase, or threats to the industry). Following open coding, axial and selective coding were then employed to explore relationships between categories, make connections between identified categories, and extract related content for a deductive approach (Cresswell, 2013; Strauss and Corbin, 1990). This approach permitted development of rich accounts, extensions of individual respondent statements; and it aided in identifying incongruent interview content or statements lending to assessment of the viability and or credibility of individual informants, angling guide knowledge, and the participatory qualitative approach to similar bonefishing based industries.

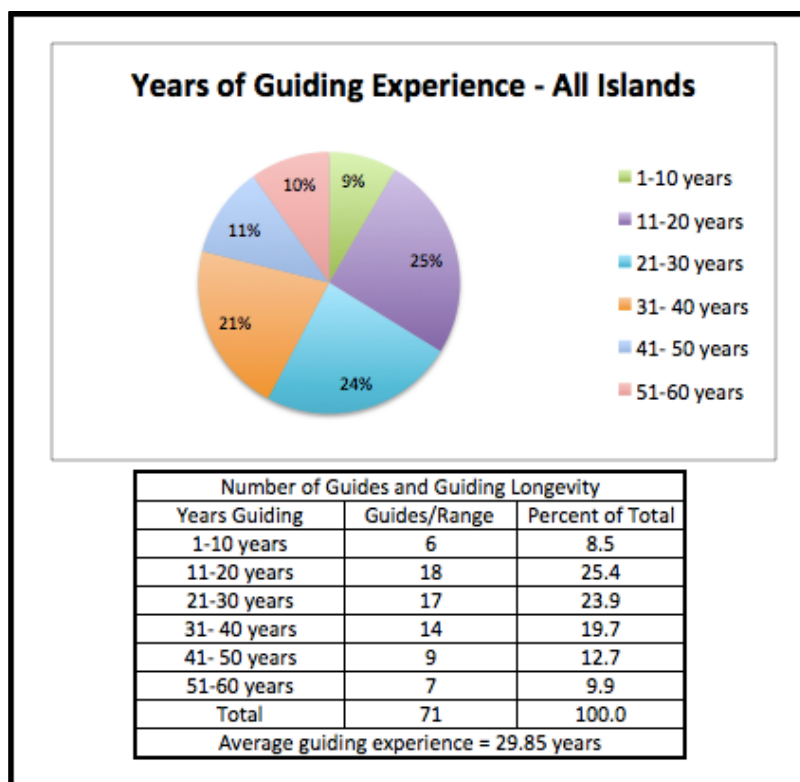
### **3.8 Interviewees**

A total of 88 interviews were completed (n=88). Of these, 71 were bonefish guides, 13 from Abaco, 33 from Andros, four from Bimini, four from Exuma, and 19 from Grand Bahama (See appendix D).

Interviewed guides vary in years of experience, with as little as 7 years to as many as 60 years, with an average of 29.8 years of experience. Roughly 8.5% of the guides have up to 10 years guiding experience, 25% between 11 and 20 years of experience, 24% between 21 and 30 years of experience, 19.7% between 31 and 40 years of experience, 12.7% between 41 and 50 years of experience, and 9.9% between 51 and 60 years of experience (See Figure 4). With the exception of one guide, all 70

out of 71 interviewed guides are male. The only known female bonefish guide in The Bahamas is from Abaco, and she participated in this study.

Figure 4 – Years of Guiding Experience of Interviewed Guides



A breakdown of Abaco guides' is shown in Table 3. The average years of experience of Abaconian guides interviewed is 27.5 years.



Table 3. Guides interviewed per island, years of guiding experience, and average years of guiding experience of guides on each island

| Percentage of Guides Interviewed by Decade of Experience |             |        |       |              |       |        |
|----------------------------------------------------------|-------------|--------|-------|--------------|-------|--------|
| Years Experience                                         | All Islands | Bimini | Abaco | Grand Bahama | Exuma | Andros |
|                                                          | N=71        | N=4    | N=13  | N=19         | N=4   | N=32   |
| 1-10 years                                               | 8.5         | 0      | 8.3   | 10.5         | 0     | 9.4    |
| 11-20 years                                              | 25.4        | 0      | 33.3  | 21.1         | 25    | 28.1   |
| 21-30 years                                              | 23.9        | 25     | 16.7  | 21.1         | 50    | 25.0   |
| 31- 40 years                                             | 21.1        | 50     | 16.7  | 15.7         | 25    | 18.8   |
| 41- 50 years                                             | 11.3        | 0      | 25.0  | 21.1         | 0     | 3.1    |
| 51-60 years                                              | 9.9         | 25     | 0.0   | 10.5         | 0     | 15.6   |
| Average                                                  | 29.8        | 40.75  | 27.5  | 31.4         | 24    | 29     |

A similar breakdown is provided for Andros' 32 interviewed guides, refer to Table 3. The average years of experience of Androsian guides interviewed is 29 years. On Bimini 4 guides were interviewed, 100% of the total guides on Bimini (See Table 3).

The average years of experience of Biminian guides interviewed is 40.75 years. Similarly, four guides from Exuma were interviewed (refer to Table 3). Their average years of experience is 25 years. On Grand Bahama, 19 guides were interviewed (See Table 3), with average experience of 31.4 years. The lengthy average of guiding years (29.8 years) is consistent between islands (range 24 to 40.75) and has both beneficial and negative attributes associated with it. This will be expanded on in future results.

The number of guides interviewed represented at least 25% of all guides on Andros, in excess of 25% on Abaco and Grand Bahama, 66% of the guides on Exuma and 100% of the guides on Bimini (refer to Table 3). Guides interviewed work full time, and either work full time for a lodge, guide independently, or divide their time between the two revenue sources. By interviewing in excess of 25% of possible guides

on each island, it was hoped that results would be more credible, thus alleviating skepticism with qualitative-based, local knowledge data sources.

## **4. Results**

### **4.1 Assessing economic and social sustainability of bonefishing in The Bahamas**

Balancing economic, social and environmental viability are essential to sustainable tourism. Chapter 4 addresses social and economic components of Bahamian bonefishing. Leading research question number 1 was designed to examine these two pillars of sustainability, and interview questions 1 through 6 (see chapter 3) were posed to help examine the fishery from these lenses. Interview extracts are used as evidence to support identified results. In each case, several interview extracts are included to bolster results.

#### Primary research questions focused on the social and economic foundations of ST

1. What does guiding mean, what motivates guides to be a guide, and what is their view of economic significance of the job?

The following sub-questions are examined to address the main question:

- 3.1 *What influences encourage guides to enter the profession and what merits (if any) are deemed through guiding that make it a worthwhile employment opportunity in Bahamian communities? (Guide motivation)*
- 3.2 *How important is guiding in the Bahamas, and how has the industry shaped Family Island communities? Role of guiding for FI communities – economic significance*
- 3.3 *How do guides measure their own success as a guide?*

### **4.2 Guiding Experience**

Longevity of guiding can be considered a proxy measure of success. Independent guides lacking necessary skills to retain a client-base, or guides unable to retain employment through a lodge, can be considered unsuccessful. Guides were observed to be consistently proud of their years of guiding, indicating longevity as a measure of personal success.

The average years of experience of guides interviewed on all islands is 29.8 years. Average longevity of guides interviewed on Abaco is 27.5 years, on Andros it is 29 years, on Bimini it is 40.75 years, on Exuma it is 24 years, and on Grand Bahama it is 31.4 years (see Table 3). It should be noted that 11 of the guides interviewed are not young guides, they began guiding late in life, and consequently their experience with guiding is limited. However as some of these guides noted, they have fished all their life, and therefore, are very knowledgeable about fish habitat beyond what they have observed as guides. Longevity statistics provided, only consider years of experience with guiding recreational anglers. If these interviewees are removed from the data, the average number of years with guiding experience increases. This is noteworthy as guiding longevity indicates guiding success, it potentially influences motivation to enter the profession, and it illustrates the importance of bonefishing to The Bahamas.

A second measure useful for determining level of guide success is the number of repeat clientele that a guide possesses. Lower repeat client rates may indicate poor guiding practice (poor customer service, unsafe practices, low catch rates, inexperience). Other variables including employment location may affect this measure. Guides working for multi-use resorts may experience higher turnover of clients and fewer angling dedicated tourists. As a result, these guides may experience fewer anglers, more novice anglers, and consequently may experience lower numbers of repeat clients. Conversely, guides working independently, or for bonefish dedicated facilities may have the opportunity for more repeat customers because of dedicated anglers seeking dedicated lodges and successful, long-time guides. Independent guides and lodge-based guides, often become recognized for their guiding successes (ability to

find fish, work hard etc.), and are frequently in high demand from anglers. Bookings of angling trips often result in requests for specific guides such that lodges need to rotate clients with guides to ensure equity (Davis, 2017).

Only 11% of guides independently mentioned repeat clientele during their interview. Of these individuals, 70% stated 70-90% of their business was repeat clients, indicating successful guiding practice. The remaining 30% of guides noted low repeat clientele rates. One of these guides works at a multi-use recreational facility, and explained the challenge with securing repeat clientele.

“Because of the high tourism rate out of Hope Town, most come only once. With the [bonefishing] lodges their repetition is much higher because they [clients] come with the purpose to fish where Hope Town their purpose is much different. If they are able to get away from the party they came with for a little, then they get out. If I was in Marsh Harbour taking guests all the time, my return [rate] would be much higher.” (Thomas Albury).

The other two guides with low repeat client rates are elders who indicated their primary client base are aged and largely deceased as evident in the following statement,

“I had a number of repeat clientele but they don't even come anymore, some have passed away and all.” (Tommy Sewell).

Other measures of personal success can be determined from responses generated from questions 4, (do you believe guiding has been a good job for you?), and 6 (how important is bonefishing and guiding to The Bahamas?). Responses to these questions include mention of economic accomplishments achieved through guiding, a topic focused on in sub-question 1.2. All interviewees addressing personal economic gains indicated the job has been lucrative for them. All respondents also claim the industry is financially vital for their communities, and The Bahamas.

### **4.3 Entry to the Guiding Profession**

Guiding origins reflect influences of motivation, a component of question 1.2. Guiding in The Bahamas is a family tradition, and 61% of respondents identified a family member, usually their father or grand father, as the impetus to begin guiding. Historically children in The Bahamas apprenticed under their father or grandfather in trades such as boat building, fishing, farming, carpentry or masonry, and motivation to begin guiding for bonefish appears similar (Karrow, n.d.).

The remaining 39% of guides provided a mix of incentives for becoming a guide. 11% identified friends who were guides encouraging entry to the profession, another 11% were drawn into guiding through American influence. For example, the elder guides who were proficient with catching bonefish for sustenance, were commonly sought out by early anglers and hotel managers who hoped they would become bonefish guides,, a common practice in the 1920's and 1930's. A small minority (3%) identified fishing as a passion, some (1.9%) made reference to divine intervention indicating God had called them to the job, and some 9% undertook guiding simply for employment. While guiding today is a highly lucrative opportunity in The Bahamas, it did not start that way.

“10 shillings [is what I got paid in 1955], that's about \$1.80 or something like that...Well and dem days it was to us, it was plenty money. In dem days when I was guidin and gettin dat kind of money for guidin, dey use to pay me like 5 shillings an hour for carpenter, so when you add up da 8-hour you work, or 9 hour you work, it was more money in doing carpentry work.” (Thomas Mackie).

Other elder guides echoed similar sentiments with memories from their early guiding days:

“We got \$40 a day [in the 1970’s]. Forty dollars a day wasn't just for me, dats for da total package, boat, gas, everyting included. When I fish, when I start to fish, [the boss] had two boats, so at dat time da money had to be split in two, I got \$20!” (Henry Bain).

“...bonefishing was someting we did for food as we grow up. If you know back in dem days it wasn't any motor so every young boy if you wanted to go fishin had to pole da boat. We used to call it scullen. If dere is no wind you had to scull an pole. Dat is why we all know how to sail boat[s] and how to pole a boat. So when we go fishin on Saturday, sometimes da boys will decide to go out on da flats and catch bonefish because old people want da bonefish. Dey bake da bonefish you see, so dat is someting different from da pan fried fish. So we would go out and catch a few bonefish just crabs on a handline.” (O’Donald McIntosh).

Monetary incentive was not a motivating factor in early guiding in The Bahamas, clearly illustrated in the following statements. Several elder guides recalled migrating to the United States to pick fruit as seasonal workers in the 50’s and 60’s, because local Bahamian employment was so limited:

“Constantly yes [guiding was less economically consistent],...you could make money by how hard you work. Like a bag of fruit, 100 pound bag, you put dat around your shoulder, you pick dat, and you fill up boxes on da ground. A guy like me, a hard worker, real hard from bonefishinen to picken fruit, I use to do like a hundred, a hundred and fifty in orange. When I get to grapefruit, I do like tree hundred box, when dey paying like \$0.10 a box... but I could make some money!” (Harold Mackie).

“[in the late 1970’s], from da time eight o'clock in da morning to twelve a clock, which is considered a half day, dat forty bucks....a whole day, a full day, is eighty bucks. From den till now bonefishing grown so big right now for a full day trip is five hundred dollars.” (Carl Rolle).

“The other wages at the time was only a dollar an hour. So I used to go to bonefish at 8:00 in the morning until 4:00 o'clock in the afternoon. That was a day at \$1.50. Then it went up to \$3.80 whatever a pound was that day [prior to Bahamian Independence in 1973], then it went up to a pound when it really started we raised them.” (Maitland Lowe).

“...at dat time I used to fish for \$4 a day, my father was fishinen for \$10 a day!” [Interviewer, was that good money back then?] Ah hell, you was rich den, \$10! When you get \$10 a day, an you change it up in da English money, dat was tree pounds 10. Now today \$10, what in \$10 now? (Ralph Moxey).

Of those 9% noting employment as a motivating factor to become a guide, only 22% specifically identified 'money' as a motivating factor to enter the industry. Despite this, guiding in contemporary times is an employment opportunity that greatly exceeds the average Bahamian per capita GDP (Bahamas 2017). The following statements reveal that entry to guiding as a profession was not really motivated by money as the work was hard and the pay little:

"I never want to do it honestly, cuz what dey used to pay my father.... back den for guiding, didn't make no sense, dey work too hard. To do 8 hours a day, for like 60 bucks? So I was like, hell no. So my dad told me, "you need to do dis, you know dis water's, you know dese waters, why you not doing dis?" He keep pushin me an I was like, na I can't do dis, I tink about it man, I'm a commercial diver, I go kill one grouper, an I make 60 bucks. You doin 8 hours, I could do it in 20 minutes! I run out 20 minutes, an I could kill one grouper, an I make 60 bucks so why work all day for 60 bucks?" (Herman Bain).

"...when I started guiding, my salary was \$40 a day. Now guide is paid up to \$130 a day. The tip is anywhere between 100 to \$80 a day so you could take home \$300 a day... 330 a day!" (Nathanial Adams).

"Da average Bahamian person right now make at least two hundred and fifty, tree hundred dollars per week. Whichin is a total of forty hours, eight hours [a day]. Forty hours a week, and you can bring home tree hundred dollars! You can go bonefishin an you can work four hours and make four hundred bucks, or work da whole eight and make five hundred bucks.... Plus you get tips up on dat..." (Carl Rolle).

"Any youngsters who's out of school, can make demself 2 to \$300 per day! It is nowhere in da office, no part of da world dat can happen!" (Nelson Leadon).

"Where are you going to make five or six hundred and some change, \$800 a day? I say where are you going to make \$5[00] to \$800 a day, unless you sell drugs. That is the only way you could make that much money a day...where are you going to make \$500.00 a half day for a half day, up to \$800.00 a day?" (Maitland Lowe).

"... the average Bahamian for a week will probably make, \$3-400... for a week!" (Travis Sands).



“I come out of school and I couldn't find a job so, I went into bone fishing, it wasn't for the money, I have went in it cuz I like it. I still into it cuz I still like it.” (Bradley Mackie).

Some (meaning a low number over respondents but significant enough to warrant mention) guides noted the fact that individuals becoming guides purely for the money would not remain in the business:

“...if they just want to guide for the money it's not the area to become a bonefish guide.” (Burnt Ferguson).

“...it's not all about the money, you gotta love da sport!” (Henry Bain).

“You have to love anything in order to be interested in it, that's why you find a lot of people don't survive in this industry because, a lot of people here think this guy makes X amount of money, so they jump the first year and try to get to make the X amount of money, but when they realize, hey dis a lot of hard work, it's as much mentally demanding as it is physically demanding, they drop out.” (David Neymour).

The following sentiments from an elder reflect what it takes to make guiding as a career:

“Would you like to make this a career, or a payroll? If you say payroll, a dog eat your lunch... cuz if he only want a payroll, he don't have no concern. If you want a career, you make it work, dat's da mentality I had when I went to work, I wanted to make it a career.” (Stanley Glinton).

Based on these results, extrinsic (financial) motivation does not appear to be a significant incentive to become a guide in The Bahamas. Historically, guiding was less lucrative than other employment options available to Bahamians, but this has shifted. The high income generated through guiding has afforded many guides opportunities unavailable to them had they not become guides. This is magnified on small Family Islands where populations are low, employment opportunities are limited, and reliance on marine resources is high, as stated by a respondent:

“...dis is one of da smaller Islands on Da Bahamas, not much to do, I call it da jungle you know because you don't have much opportunity to work. You have basically da sea life, it's da only ting we gat to go from... cut dat off, dat's us... we're done.” (Alvin Greene).

Many guides interviewed were boat owners, some were lodge owners, and some had expanded into other avenues like cottage rentals, car rentals and restaurant operations, recognizing the impact of the industry, and the potential for income generation. Guiding has provided them the financial ability and stability to invest in entrepreneurial enterprises. Guiding has also provided a level of education with elite clientele that has helped guides achieve higher levels of economic and social success, as a respondent states:

“...look around (gesturing to his lodge), it's a great ting. You can have [anything] in da world, if you take your guiding profession serous, you can have a massive life. Massive means so great, beyond super great, and huge, you understand? Its amazing, to see who you meetin, da type of people you gonna to meet, who you gonna introduce yourself to or your wife, your family, everybody, it changes your life. Even if you make let's say 150 or 200 tousand a year, normal on guiding, I'm just sayin, if you're not a lodge owner, if you're a single guide, you're making 250 grand a year. Dat's a lot of money, you understand? Oh yeah, I'm telling you, dat's a lot of money. Each guide here make a minimum of 10 to \$15,000 a month. A month, do you understand? No expense[s], I mean zero expense[s]. Some guides even pay the National Insurance, which they are entitled to pay. I mean think about it, listen, it's a great ting.” (Charlie Neymour).

Despite significant income potential through guiding, motivation to enter the profession seems more opportunistic and intrinsic. Because fathers or grand fathers were guides, employment connections were already established, and the associated skills and knowledge needed for success as a guide were readily available, facilitating a smooth entry into the profession, as the following statements indicate:

“my dad was a big inspiration to it. Growing up he would always take me fishin, it wasn't that he wouldn't take nobody else, but fishin and huntin requires you to

wake up relatively early so whoever got up to go, went with him, so he got me involved in it.” (Dana Lowe).

“Our survival here was fishinen, my daddy teach us. At dat time all da young men.. dere was no jobs per se, so da only ting you could have done was collect conch, crabs, and crawfish to take to Nassau.” (Henry Bain).

“My old man was a fisherman from creation, so he teach us all of dis stuff while we were young. He teach us da spots in da bight, he teach us how to track a bonefish like you track a deer. Bonefish leave signs behind, so you could you know, what you lookin for when you fishin.... I can tell, if I am fishin here an I looking at da bottom, I could tell you 50 feet or hundred feet dere are some bonefish ahead. Just because of da tings dere [on the bottom].” (Ornald Greene).

“As a kid I used to do a little bit of spongin wit my grandfather and my dad so I kind of learned da water... day by day as I went on, I put everything together, just try to master it.” (Leslie Greene).

“Well I come from a big family of guides. Da Neymour name is one of da biggest name in fly-fishing. Ivan Neymour [deceased] being da patriot of da family, and actually holds da record for da biggest big fish on dis island, 16 pound eight ounces. Dat's something to beat! I got involved because of my uncle, I stayed in it because of my brother BN, CNr, FN, DN, DIN Jr., and so much other Neymours. I come from a big family of guides, dat's why I love dis industry!” (Frankie Neymour).

All guides stated they were very happy being a guide, and felt the career choice had been very good in their lives. When asked what they liked about guiding, and what motivated them (beyond financial gain or familial ties), results varied: 8% identified appreciation for being outdoors, the scenery and being on the water; another 8% noted they found guiding fun, 13% identified a love of fishing, 18% appreciated making people happy, and 27% stated they enjoyed meeting people (See Figure 4). Connections with clients from across the globe, with a variety of experiences, qualifications and backgrounds, ranked the highest factor in what guides identified as a reason for guiding. These connections may bridge socio-economic, gender or racial divides

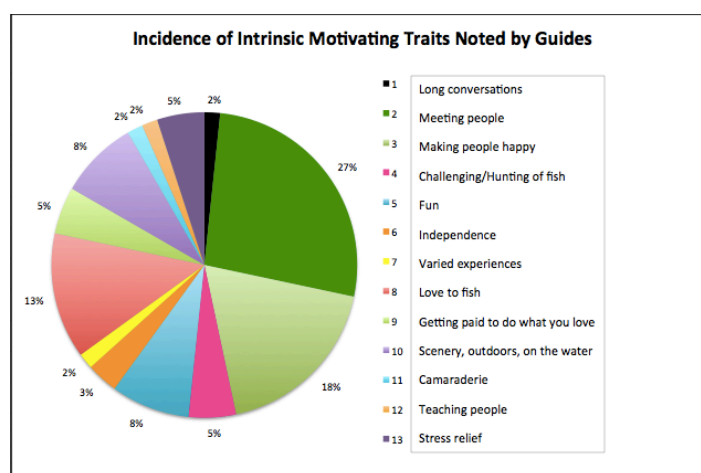
providing educational opportunities for guides that most Bahamians would not experience, as indicated by some respondents:

“One of the things about being a guide is that I'm taking out clients after clients, many different clients, and the clients that you take out or a little bit above average. Most of them are millionaires... the clients that you take out, they often have thousands of employees and you have them sitting in your boat, and they listen to what you say as a regular guy. They have thousands, those guys sometimes influence the president on some decisions. We have the guys from Coca Cola come down, many different millionaires from all over the place and they sit in your boat. Sometimes you would sit there and you think, that these guys don't know that you're in the boat, and all they talk is millions and millions of dollars so that's one of the inspiring things about being a guide, [is] that you can actually conversate wit these guys, and tell them this is how you think, and this is what you like to see done, and they will take that into deep consideration.” (Douglas Saunders).

“Meetin other people sometimes, sometime you guidin you meet up wit doctors and lawyer. You meet up with all kind of people, and educate you as well you know?” (Thomas Mackie).

“I would certainly recommend this particular job experience to any young Bahamian willing and wanting to become an independent bonefish guide because he now open himself to the entire world. He can get a network of people and clientele in the palm of his hands, that could take him from one level to a whole other level of becoming a superior individual.” (Shawn Leadon).

Figure 5 – Reported motivations to work as a guide.



Contact with a level of tourist (highly educated, affluent and environmentally informed) that most Bahamians do not have, provides a degree of education for guides that a majority of Bahamians miss. Although tourism is a significant industry in The Bahamas, the bonefishing sector generally draws more exclusive clients, and the setting is more intimate, often a single angler and guide on the flats for hours and even days (David, 2017). These close connections have helped facilitate new opportunities like entry into local politics (notes, 2015, 2016, 2017, 2018), acquisition of boats, and development of new lodges, as illustrated in the following statements:

“...five or six of em [clients] realized that we weren't happy there and they say guys you know, we want to get together and do something for you... and they say, ‘we wanna get you guys started, we’re gonna start a company for you, we’re gonna get you all the boats, all the engine... we’re gonna come down and set it up.’ So these guys, they did come along, [and] they got everything set up. They found us the accountants and so forth, and put the business together for us and here we are today. But yeah we got it now for twenty-five years.” (Jeffrey Pinder).

“One of your former Secretary of the Treasury, he used to be here, I'm not going to call his name, but he used to be here and he got in with one of our top guides and they went out and rent a place after. He came here for about 4 years and the guide offered him the deal and they went out, renovated a place. When they finish the renovation, they [later] moved and they build another place [lodge].” (Samual Raymond Mackie).

“So my brother used to guide [in the 60’s], and he landed a 75 pound cuda [barracuda] on 6 pound monofilament line with two Jews. They were so impressed with him, they took him away to Chicago, he was seventeen at the time. They put him through school because you know like I said, there was no school in those days. You had what you call, a church aid school, they would teach you the alphabet, teach you to read and then write, as best as they could, but the teacher had not really had [schooling] themselves. So they took my brother back to Chicago with them, they put him through school, and then they put him to work in [their] company, where he spent all his life.” (Samual Raymond Mackie).

Based on respondents, being a guide has been valuable, financially and socially. This measure may suggest that bonefishing tourism from an economic and social standpoint is indeed a form of sustainable tourism.

#### **4.3.1 Attributes of a Good Guide**

By identifying key attributes necessary for success as a guide, achievable merits from guiding can be assessed, the importance of the industry can be evaluated, and some measure of personal success can be determined. Guides identifying necessary traits to be successful guides need to reflect on their abilities, and the skill sets they see or have learned, from other guides. They will be evaluating positive and negative attributes. Noted important guiding skills can in-turn be used as measures of personal success. Valuable employability skills garnered through guiding, clarify the importance of bonefishing in The Bahamas and the importance of ensuring it as a sustainable form of tourism.

A lengthy list of responses was generated from this question (See Table 4). Concepts like, good eyesight, the ability to read the water, proficient boat handling, aptitude with finding fish, and angling capability, can be considered angling proficiency and were merged accordingly. Other similar attributes were similarly grouped into common categories.

Four items representing 26.3% of the responses are associated with angling capability, with 17.9% of all respondents mentioning fishing knowledge and skills as important for a good guide. The remaining 73.7% of responses can be considered character traits, implying that angling/boating skills are less important than

communication/ interpersonal skills. Attributes like, being passionate, nice, serious, driven, courteous, helpful, friendly, knowledgeable, having the right attitude, respectful and entertainer, can be called interpersonal skills. Patience as an attribute tops this list with 11.6% of the guides mentioning the trait, while passion, love, or a hunger for fishing was noted by 8.4%. The ability to offer good customer service was mentioned by 7.4%, having the right attitude by 6.3% and being able to persevere was noted by 5.3% of the guides. Many guides recognized the importance of not only angling skills, but also communication and interpersonal skills. Many also recognized the need for proficiency with multiple traits, as stated by a responded below:

“.. the combination of everting. You gat to know your equipments, know your water, know your anglers, and know yourself.” (Leroy Ginton).

The majority of guides ranked angling skills less important than personality, and some directly articulated this stating:

“...guiding is not only about taking somebody on a bonefish flat, it’s about knowing how to treat your guest with love and other things like that.” (Douglas Saunders).

Table 4 – Noted attributes of a good guide.

| Important guide attributes, as per guides interviewed |                     |                     |
|-------------------------------------------------------|---------------------|---------------------|
| Angling Proficiency                                   | Number of Responses | Percentage of Total |
| good eye sight                                        | 3                   | 3.2                 |
| learning tides                                        | 2                   | 2.1                 |
| fish movement                                         | 3                   | 3.2                 |
| fishing knowledge and skills                          | 17                  | 17.9                |
|                                                       |                     |                     |
| Interpersonal Skills                                  | Number of Responses |                     |
| friendly                                              | 1                   | 1.1                 |
| good communicator                                     | 2                   | 2.1                 |
| courteous                                             | 2                   | 2.1                 |
| respectful                                            | 3                   | 3.2                 |
| nice                                                  | 2                   | 2.1                 |
| generous                                              | 1                   | 1.1                 |
| helpful                                               | 1                   | 1.1                 |
| patient                                               | 11                  | 11.6                |
| able to handle guests                                 | 1                   | 1.1                 |
| flexible                                              | 1                   | 1.1                 |
| discipline                                            | 1                   | 1.1                 |
| educator                                              | 3                   | 3.2                 |
| respect for yourself                                  | 2                   | 2.1                 |
| consider it a business                                | 1                   | 1.1                 |
| serious                                               | 1                   | 1.1                 |
| right attitude                                        | 6                   | 6.3                 |
| personality                                           | 3                   | 3.2                 |
| learner                                               | 3                   | 3.2                 |
| able to read people                                   | 2                   | 2.1                 |
| provide good customer service                         | 7                   | 7.4                 |
| perseverance                                          | 5                   | 5.3                 |
| entertainer                                           | 3                   | 3.2                 |
| passionate/love/hunger for fishing                    | 8                   | 8.4                 |
|                                                       | 95                  | 100.0               |

Guide training evolves as a progression from this question, and 17 or 24% of the guides mentioned guide training as a concern they have with the industry noting there are not enough young people becoming guides, and there is insufficient training. This will be expanded on in Chapter 6.

#### 4.4 Significance of guiding for employment.

Examining the value of the job may help determine the economic and social significance of the industry, the importance of bonefishing to Family Island communities, and self identified successes.



All guides indicated guiding has been a very good job for them. Longevity in the profession, reiterates this point since so many of the guides have been on the job for so long. An assumption can be made that guides unsatisfied with their job would leave the profession, and sustainability would be questionable.

Apart from the economic importance of guiding as a job, guides also identified other benefits, such as meeting new people, learning new things, working outside, being on the water, and making a significant income. This latter point some explained, has allowed them to travel internationally, establish their own businesses, and achieve a level of financial security exceeding that of an average Bahamian income (Bahamas, 2017a.)

#### **4.4.1 Guiding as a career choice for young Bahamians**

In identifying the worthiness of guiding as a career choice, guides reflected on their experiences and accordingly identified measures for success as a guide. All guides indicated that guiding would be an excellent career choice for young Bahamians with some caveats. Some commented on the job being hard work, but all agreed it is worthwhile, as reflected in the following statements:

“Well, you can't go wrong doin da guidin if you have da patience to do it. I mean it's just as hard as doing da construction, you are in direct heat, da construction is even a softer work den guidin to be honest. Even though people look at it to be an easy ting, it's still challengin to be out dere in da direct heat, and dealin wit da you know... work, findin fish and makin it happen.” (Drex Rolle).

“It was a blessed opportunity. It took me, other than that, I would have never seen some parts of Da Bahamas and the Florida Keys.... We went into Daytona one time, Islamorada... I think it is a good job. It is a good way of meetin people. I think they [guides] should be properly trained, it is hard to work with people.” (O'Donal McIntosh).

“I think it is, if they are a person that is real personable. You have to have the right attitude you know, it is a workin career, it is not an easy job. If you study the environment, study the fish, do whatever it takes to get your client on the fish and treat people right, they will come back.” (Justin Sands).

Overwhelmingly all respondents independently agreed that guiding has been a good opportunity for themselves.

#### **4.5 Importance of bonefishing and guiding to The Bahamas?**

All guides (n=71) and non-guides (n=17) stated the industry as very important for The Bahamas. Frequent references were made to tourism, increased employment, potential for income generation, growth in the industry, and economic spin-off, with the majority of responses aligning somehow with the economic importance the industry provides. (See Figure 6).

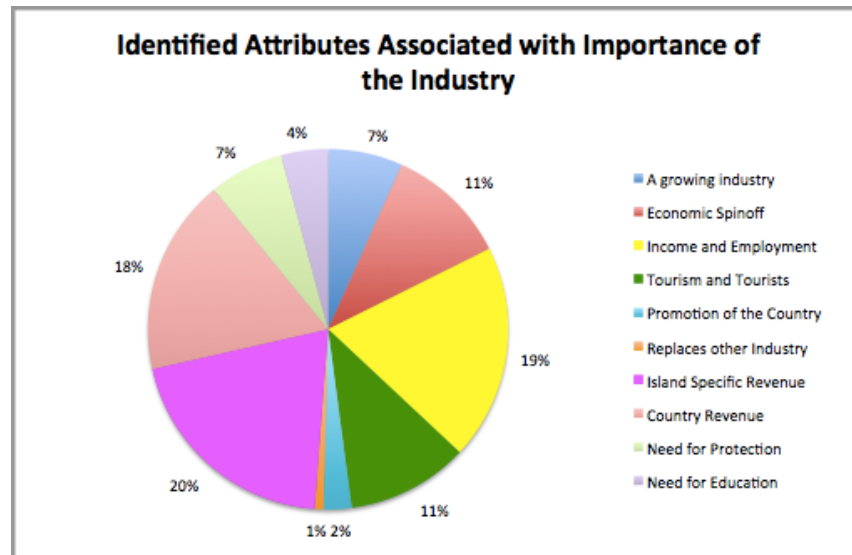
Roughly 11% of responses to this question directly mentions The Bahamian tourism industry, or use the word, ‘tourists’. Respondents note the importance of tourism to The Bahamas, and the importance of bonefishing especially to Family Islands, as the following statements reveal:

“Oh dat is very important. If it wasn't for dat we would've being so far away from where we are now. Dat it would be like da east from da west because, all our survival is guests. Witout dat we couldn't survive because we don't have any industry of our own in da Bahamas to create. If it wasn't for da tourists, and stuff, it would have been away in da balance and fine wine!” (David Pinder Sr.).

“Bonefishing in da whole of da Bahamas is very important because that bring da majority of da money that comes from tourists. Just about every island now in da Bahamas has two or three lodges and people pay big bucks to come bonefishin man. Dey also use bonefishin now for advertising in da Bahamas. Bonefishin is very, very, important to da Bahamas now. When it comes to tourist dollars, I'd say it's 65 to 70%.” (Stanley Glington).

“...right now it's more dan it [bonefishing] used to been because back den it was on da small scale but nowadays it's gettin more and more and more. It's one of da highest income I tink in da Bahamas tourism industry. So I tink it's more important or more.... a higher scale dan it use to be, so it become more important dan anything right now. Da sponging isn't dat much, da lobster is droppin you know? So da bonefishin is coming up and up.” (Alvin Greene).

Figure 6 - Importance of bonefishing and guiding to The Bahamas



Overwhelming consensus among the respondents shows the high importance ascribed to bonefishing in The Bahamas and the need to ensure sustainability of the fishery. Failing to acknowledge the importance of the fishery could indicate bonefishing is not sustainable because it is not meeting the needs of local people, economically, socially or environmentally.

When interviewees were asked the follow-up question, “what do you think the area would be like without bonefishing?”, one elderly respondent felt people could fall back on other marine resources like conch and lobster.

“Well, we have uder tings, we have da crab, we have da lobster, we have da conch, an da land crab...” (Stanley Forbes).

Another respondent was not as optimistic about any loss of bonefishing, as he stated:

“Well, if it [the bonefishing industry] passed through [declined or left altogether], it would be a ghost town.” (Ezra Braynen, Androsian restaurant owner).

Still another guide referenced historical industries such as farming and fishing as alternative options should bonefishing decline, but then explains the challenge of overconsumption and target species angling:

“We would probably go back to farming, where we have to do some potatoing, we would probably take more from da sea... you know everything's getting, you know da world's population is growin so much now rapidly, you know everybody loves conch and I'm sure you love conch salad too. If it was not for bonefishin, some of da other species that we fish, we would have to turn the conch, grouper, snappers and then more people would get involved, so then dat species would then start to decrease and if you don't put a sustainability on conchs, groupers and all of dose others, all of dose tings have a time cycle in growing. If da population starts to go towards da species an break dat circle of their growth, then now you will be depleting dat industry, so that's how significant bones are, we don't want to loose it!” (Douglas Saunders).

Although conch, lobster, grouper and snapper are mentioned in the preceding comment, many respondents repeatedly expressed concern over these fisheries, suggesting over extraction and insufficient regulation are threatening their future. This will be expanded on in Chapter 6.

Roughly 20% of respondents directly mentioned employment and income that is generated through bonefishing when considering the importance of bonefishing. Some respondents referenced a 2010 study by Fedler placing the economic importance of the industry at \$141 million US in 2008/9 (Fedler, 2010). While some interviewees provided the correct financial contribution assessed in that study, others did not. Some felt the assessment was too low, recognizing the global financial downturn in 2008 and multiplier effects associated with bonefishing:

“A study was done, and I think it was by BTT a few years ago. 141 million dollars came into the country a year. I think that number is low, I think it is a lot more than that. (Clint Kemp).

“Bonefishing in my opinion is one of the most prolific industry here in this country. Bonefish & Tarpon trust did a survey some eight years ago, I think it was 2009 or 2010, somewhere about there, and the survey said it was some 140 million dollars per annum, but I can tell you it is much more than that. It is double or triple that. There are a lot of factors that were not factored in. Things have changed, it was during that phase when there was a down turn in the economy and so they were only able to get that specific number for that specific, you see what I'm saying? So this bonefishing has far more reaching effect then just guides and lodges. It is the local stores, grocery stores, it is the taxi drivers, it is the airline operators, it is the toll operators, it is the car rental companies, a lot of small little souvenir stores. It has far more economical impact and reach than just the lodge and the guides. Everybody benefits, and so if there is a downturn in the amount of anglers moving in and out of this country, that takes a huge [toll]. Both of money, and... particularly for the Out Islands that has a lot of revenue not coming in, you have to support the local economy.” (Shawn Leadon).

About 20% of the guides identified island-specific economic gains associated with bonefishing:

“...as an industry, it brings into Abaco alone, it is like 21 million dollars into our economy.” (Buddy Pinder).

Similarly 11% identified a multiplier effect through secondary and tertiary spending of generated income. Respondents noted taxi drivers, cooks, grounds keepers, maids and other service personnel in their responses, as a guide stated:

“...it provides work for not just guides. What makes that money, that 21 million dollars, it is spread out over everybody here, the hotel owners, the storekeepers, the liquor storeowner, the guy who rents a car, guys who rent boats. It is spread out over the whole Island, not just the people who are just makin that money on the bonefishing. No, it is for everybody, it is good for the whole island.” (Buddy Pinder).

About 7% directly noted the industry is growing, 3% indicated bonefishing tourism is being used as marketing and promotion for the country, while 18% acknowledged a benefit to the whole of The Bahamas. Roughly, 7% of the responses

indicated the high level of importance that bonefishing provides, justifies the need for conservation measures, as stated by one of the guides:

“It is a big part of our industry, and if you think about the amount of money that bring in, that come in through fishing, it's unbelievable. The tourism industry is, and that's why we really need to protect it a little bit more.” (Phillip Rolle).

Some (4%) noted the need for increased education for both young people potentially entering the profession of guiding, and for the general Bahamian populous.

“...that's my, one of my main reason, why I think it's crucial and important to get this into the system, especially the school system.” (Meko Ginton).

Finally, one guide addressed the importance of bonefishing to The Bahamas, making an analogy to the United States and their appreciation for Basketball:

“Bonefish to Da Bahamas is like how basketball [is] to the United States. Get rid of basketball, cut da United States in half, get rid of bonefish, cut Da Bahamas in half.” (Leroy Ginton).

The economic importance of the industry noted by some interviewees warrants consideration towards sustainable growth levels. Is there room for more guides and lodges? When prompted, one respondent stated:

“Bonefishing has been so important to dis Bahamas because it cause a great take over wit financial part. It become so great in da part of financial part and in da touristic part, because tourists increased tremendously wit bonefishin. Da people dat come bonefishin come sometimes [and] some of da lodges are so full dey have to turn dem down, they're booked. So right now bonefishin is very important. Bonefishin is one of da most important tings to da Bahamas and to da outer islands versus Nassau because Nassau which is New Providence, dey don't really bonefish, but in da other islands, dey depend on da bonefishin season.” (Burnt Ferguson).

Some interviewees were asked to expand on the issue of industry growth, giving consideration to whether there is room for more lodges and guides. The following statements summarize respondents' sentiments:

“I think there’s lots of room, it’s really untapped. It has immense potential to grow and so it is very important, we have become one of the leading businesses here...the more persons in this game, providing guides and being able to supply the product for the many visitors that come, the better.” (Cheryl Bastian – lodge owner).

“right now Andros could hold maybe another 50 small lodges. Why I say that because right now we only tappin 10% of da fishin area. We live on da front side of Andros man, we live on da waterfront... I really tink dat we can handle more jobs, more lodges. Some people may say no, but we don't have no hotels, we don't have noting else for da kids to do, so where are da kids going to end up? In Nassau, in problem areas...” (Ornaol Greene).

An elder guide and lodge owner who had witnessed the loss of reputable guides he trained, and the establishment of several new lodges in close proximity to his facility, provided the exception to this sentiment, as he stated:

“That has been one of the drop off because now we've got more fishing lodges within I would say a 3 mile radius, more right here than anyplace else. Der are too many. The reason being, there's one, two, three, four, five of my top guides now, each one of them own der fishing lodge, and all of us are scrapping, all of us are scrapping here, [we] get a little bit here, or get a little bit there. If they had continued going with the way that they were going, they would have been making much more money. But right now, I make a couple of dollars. To start with, they have to borrow money to subsidize what they get from the angler to build a place with, then they gotta pay that off, and then they got to look at their overhead. So really, they have actually put their feet in their mouth by taking over my [business].” (Samual Raymond Mackie).

The other proponent to more guides and lodges, an elder concerned about angling pressure and declining bonefish populations (discussed further in Chapter 5) stated:

“ I would say right now in Mangrove Cay, it's too much pressure on da bonefish. But it's noting da government or nobody can do anything about it because why? Someting could be done about it, but government would have to have jobs prepare for da young kids when dey come out of school for da young people to be doin.” (Ralph Moxey).

One other response places a caveat on guide and lodge growth, indicating more growth would be acceptable if it was Bahamians filling the positions:

“I think, I don't want to be too harsh, but I tink dere is room for Bahamian lodges. Da reason why I say dat is because, if I as a Bahamian Lodge make \$100,000, it comes into da Bahamas and into da Bahamas economy. Da foreign lodge, dey would just spend enough down ta kind of run da lodge an pay da staff. So I tink if Bahamians get into it, it will be helpin yourself, and helpin da economy as well.” (Timothy Smith).

Echoing a similar sentiment, an interviewed Ministry of Tourism official clearly supports the idea of growth as he stated:

“The great thing about the Bahamas is our diversity, the fact that we have a hundred thousand square miles of shallow water, and we have a tremendous fishery resource. We have diversity, a great diversity in our sector. There are high-end lodges and there are mid-range lodges, and there are more affordable ones at the lower end. In addition to that, you've got just huge potential in terms of fisheries that can be developed and have not yet been touched, so we got great room for expansion.” (Benjamin Pratt, Bahamas Ministry of Tourism).

Despite this, the Ministry of Tourism apparently recognises that regional variability limits growth potential in bonefishing. An extract of interview dialogue with a Ministry official illustrates this point:

“It is important that we recognize that on some islands there may be a need for limitation of lodges and guides, for others we are totally under developed, and there are so many opportunities for expansion. (Benjamin Pratt, Bahamas Ministry of Tourism).

Interviewer: Specifically which islands are you referring to?

“ I would say the islands to the south, south of New Providence.” (Benjamin Pratt, Bahamas Ministry of Tourism).

Interviewer: Do these islands have fisheries that would support increased angling pressure?

“ I think so especially for the southern islands. Obviously, whatever is done should be supported by science, so the ongoing studies that are being done by groups like Bonefish & Tarpon Trust and so forth, will be very, important for planning purposes. We don't want to just have a situation where people are just building lodges or increasing the number of guides. We have to actually do that based on the science to support it. Then, based on those surveys, based on those numbers, we would be able to monitor fish movements and population, and the



impacts of catch-and-release overtime. So anything that we do in the future in terms of sustainability should be based on capacity.” (Benjamin Pratt, Bahamas Ministry of Tourism).

Interviewer: At present could I buy property on Andros and open a new bonefish lodge if I wanted to?

“There is nothing stopping you from doing that, once you would have of course met government regulations in terms of investment policy and so forth. I believe and I foresee the time coming, when there will be a more formal process to look at the carrying capacity, before approvals in that area are actually done.” (Benjamin Pratt, Bahamas Ministry of Tourism).

The consensus among those interviewed is that bonefishing is very important to The Bahamas, and to their respective island. However, with no current limits to growth in the industry, and belief that there is room for growth, sustainability becomes questionable without additional examination of the fishery. Carrying capacity of the fishery has not been determined, although Ministry officials mentioned the term, hence a precautionary tactic might be prudent with immediate limits on growth.

Early drafts of Bahamian flats fishing regulations released in 2017 (Bahamas, 2017b.), considered banning foreign ownership of bonefish lodges. Under the regulation, bonefish lodges would be required to have a Bahamian partner, and under current Bahamian legal employment frameworks, guides must be Bahamian. This proposal may have expanded economic revenue from the industry for Bahamian peoples, potentially making it more sustainable economically and socially. This draft regulation was widely rejected by the angling community and subsequent regulation drafts eliminated the requirement. The final law passed does not mention whether a mandatory domestic ownership or partnership is desired, so the economic impact of the fishery may be less significant with foreign ownership of many lodges, as an issue

addressed in Chapter 6. As of 2019, these contentious laws have been completely struck down, leaving need for regulations (Bahamas, 2017b.).

## **5. Results 2**

### **5.1 Assessing environmental sustainability of The Bahamas bonefish industry.**

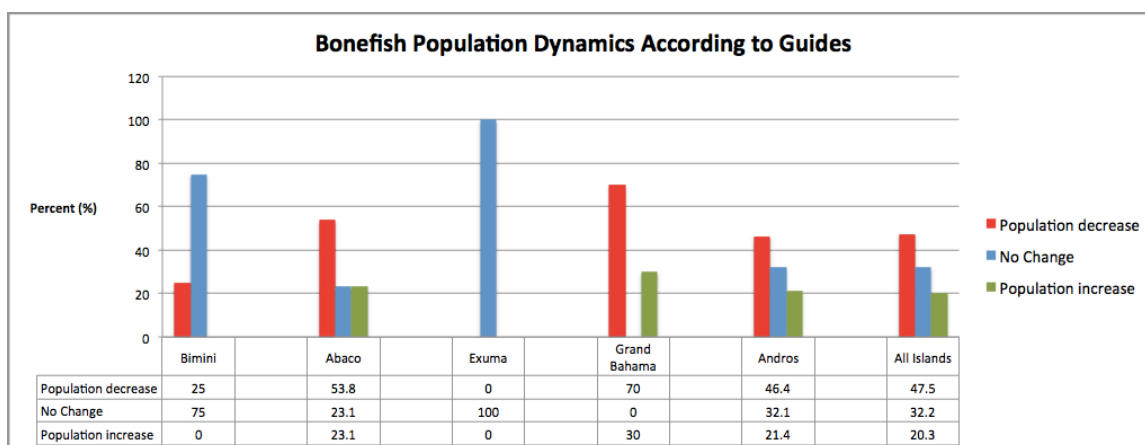
The environment is the third pillar of sustainable tourism to be examined, and the primary focus of this chapter. Failure to protect environments upon which tourism frequently relies, ultimately leads to unsustainable outcomes. Interview questions 8-10 were posed to help determine health of recreational fish populations in The Bahamas, and in turn the sustainability of the fishery. As in chapter 4, interview extracts are used as evidence to support identified results.

### **5.2 Guide Perspectives on bonefish (*Albula sp.*) population changes.**

Bonefish are the foundation of The Bahamian flats fishing industry; consequently, healthy sustainable populations are critical. Tarpon and permit constitute a smaller share of angling target species in The Bahamas, and guide comments reinforce this fact.

From 71 interviews with bonefish guides on 5 different Bahamian islands, almost half (47.5%) acknowledge a decline in bonefish numbers, one-third 32.2%) indicate no change in population, and one-fifth 20.3%) have seen population increases. These perceived changes reflect change over time where guides were asked to consider if there are more or less fish now, than when they started as a guide (See Figure 7).

Figure 7. Guide Perspectives on bonefish (*Albula sp.*) population changes regardless of years of experience (n=71). More specifically, all elder guides perceived significant declines in bonefish with one noting a small increase post the 1980's time period to a population level that was still far lower than when they began guiding in the 1950's. Young and/or less experienced guides perceive moderate increases in bonefish numbers.



All elder guides interviewed, observed changes in bonefish numbers, suggesting population decline, population shifts, and in one case, a population increase. Some elder guides were so pessimistic about current bonefish levels, they no longer felt confident they could ensure clients would catch bonefish if they were guiding as illustrated in the following quote:

“Da bonefish at dat time, you could go and stand up on da beach dere wit your suit on, your shoes, good shoes or whatever, floor shine shoes, an just trow your line out, an catch whatever amount of bonefish you want to catch. But not today now, its...you got to go, ah hell, you got to go dere for hours and I told da guides, dere's only a scrap of bonefish. It boddars me to go do it now because if I go dere now I may have to stay all day before I catch one fish. Now like when I did start, I go dere and catch like about, tirty fish in da mornin, maybe 50 fish. For da month, I caught about 700 fish. At dat time it wasn't catch and release, it was catch and keep. Da population was extremely high, vee had fish around here, vee had fish! It's almost below zero, it's dat bad now. Honestly for me to go in da boat, to go fishin wit a guest, as famous as I was and is, I would worry cuz I don't know if I could find any fish. During my time, my fame was dat if I go in da boat, in da seventies and eighties, an I take you out dere, an I come back in here and you say dat we ain't catch no fish dat day, you just tellin a lie on me!” (Ralph Moxey).

Another elder guide corroborates similar fish numbers from a different island, as he states:

“Yes sir, [there were] a lot more. Well dere's a lot of changes. Like wit da fish, da numbers an da amount. All of dese tings changes because in dat time, you didn't really have to look for da fish. Any place you go, da fish were dere. I know dere use to be a school of fish in dis creek dat was solid from shore to shore. You pollin, or sailin, whatever you do, dey be breaking up in big schools in front of you, an dey keep on breakin up until, right now I don't tink you'll see six schools during da summer time. We use to sit in da house and when dey come cross da shallow, it looked like a hurricane, but you don't see dat no more.” (David Pinder Sr.).

The sole elder guide claiming there are more bonefish explained that because of more water in the ocean, there are more fish. Increased water levels he explained are a result of melting polar ice caps, as he stated:

“...now what happened, you mighn't see da same amount daily, like maybe years gone by, because we got more water now. See we have more water in Da Bahamas because of da temperature. You remember those places what used to turn ice in da wintertime? Dose places now do not turn ice anymore, so dat water has to find someplace to go, an it travels. A lot of dat water is in Da Bahamas...” (Charlie Smith).

Regional (i.e., inter-island) variation has significant impact on overall observed Bahamian averages. On Bimini, 25% of surveyed guides indicate a decline in bonefish and 75% indicate no change. As the sole guide who observed a decline in bonefish explains, the decline may be a shift of the fish rather than actual decline:

“It [the number of bonefish] was definitely higher but dat don't necessarily mean dat it was more, so much fish. What cause the fish to be harder to find and to catch is because all da diggings dey did here wit the canals. There are tremendous schools of bonefish livin in da canals dat dug, South Bimini and North Bimini, up to Bimini Bay. Dey're tremendous schools a bonefish in dere and seems to me sometimes dere are world records in da school.” (Ansil Saunders).

On Abaco, more than half (53.8%) of the guides indicated declines in the number of bonefish, 23.1% noted no change, and the remaining 23.1% identified

increases. Similarly, on Andros, 46.4% guides observed a reduction in bonefish, 32% stated no change while 21% had seen an increase. On Exuma, all guides stated there had been no change, and on Grand Bahama, 70% of reported reduced numbers of bonefish, while 30% reported increases.

On three of the five islands (Abaco, Andros and Grand Bahama), the majority of guides perceived overall declines in bonefish. The majority of guides on the other two islands (Bimini and Exuma) reported no change in bonefish population. It should be noted that on Bimini and Exuma, there are fewer guides and lodges, hence a reduced level of angling pressure, which might have negatively impacted local fisheries. Higher angling pressure on Abaco, Andros and Grand Bahama, where the bonefishing tourism market is larger, and according to some guides growing (Davis, 2017), may be causing noted declines.

### **5.2.1 Bonefish (*Albula Sp.*) Population Declines**

Of the one-fifth (20.5%) of guides perceiving an increase to the bonefish population, 43% indicate numbers had declined from when they started guiding, but noted recent increases. In 1987, the Bahamian government implemented a netting ban (Bahamas, 2017d.). It is possible that guides who started guiding prior to 1987, observed declines in bonefish numbers before the ban, and increases after the ban. The netting ban may be a factor in observed population increases, and guides attribute more bonefish to less netting. One elder guide noting an increase in bonefish, began guiding prior to the netting ban, but he acknowledged no decline prior to the ban, with only a slight increase in bonefish numbers in recent years. This guide is from Andros

suggesting regional variability of populations, fishery health, threats and localized perceptions.

Roughly 57% of guides who acknowledged increases in bonefish, began guiding in the 1980's or later, hence they never observed pre-netting ban bonefish levels. Increases in bonefish were attribute to the netting ban, changing climate, and proper catch and release. One guide simply disagreed with elders who claimed bonefish population to be much lower than they are now. The following statements reflect these perspectives:

“Well you know, there was a time we had there were a few fisherman were nettin the bonefish for food purpose and as lot a those guys are now pass [deceased]. So we don't have that problem no more you know, an everyone is wising up now. They understanding that this brings in million of dollars into the country. So you know that made a world a difference you know.” (Tommy Rolle).

“Well I tink what happened back in da sixties, da government probably didn't thought dat fishin bonefish would have been da way it is today, so dey used to allow da fisherman to go in wit nets an capture dem. I tink dat's what really killed da population.” (Rudolph ‘Timer’ Coakley).

“Yeah more bonefish since dey stopped da nettin cuz when dat nettin carry on, man dat was killin it, our industry, I talkin about doin it bad! Dese are guys dat go and haul tousands to market...” (Harlon Sands).

“...to me dere are more fish, but I tink da weather has someting to do wit dat, da patterns change it. Dis year dat ting which dey call El Nino, has someting to do wit dat, dere is still a lot of fish but, dey moved.” (Timothy Smith).

“Right now, it's more bonefish because since da government had stepped in, wit da nettin and puttin a penalty for it so dat if people be caught poachin bonefish, it increased tremendously.” (Burnt Ferguson).

“ we started to see more bonefish now. I really think it's because of da net, da nettin. Dey use to haul den.” (Carl Rolle).

“Well no doubt if you listen to the elderly folks they would tell you I think there is more Bonefish back then than now, and I can tell you why they are incorrect. It is now more bonefish then back then and that is simply because back then when

they went guiding they caught 20, 30, 40, or 50 fish. They kept those fish whether there was a sporting time frame or not, they would not have known that. Eat fish is able to produce well over 300 000 if you taken fifty fish you times 50 x 300 000 eggs, how many fish do you think you were killing? So my Dad decided to put in the catch and release program back in the early eighties.”(Shawn Leadon).

In addition to changes in fish numbers, select guides also noted shifting population dynamics. Some guides felt average bonefish size had reduced, while others felt bonefish size had increased:

“Well there are less amount, but dey are bigger bonefish, bigger bonefish, but da big ones dey get so smart now, dat's why dey still growin big! Da average size now would go between tree and five pounds but you have bigger ones too.” (Rudolph ‘Timer’ Coakley).

“They're [bonefish] getting bigger, yeah they're getting much bigger.” (Garth Thompson).

Other guides mentioned temporal and spatial shifts in bonefish, noting increased ‘spookiness’ of fish, as reflected in the following statements:

”The fish seem, like I don't know, the fish to me is plentiful in one area like it used to be, but now they’re more scattered. Like sometimes you don't find that amount of fish.” (Donnie Lowe).

“Dere was more fish. Da fish were not spooky, an dey would come almost straight into da boat, 5 feet from the boat. You would just drop your fly overboard like dis, an dey'll come and pick da fly up.” (Joe Bodie).

“The number of fish...the fish are more weary now. The fish are more smarter than they used to be, it's like they went to college!” (Samual Raymond Mackie).

Some guides suggested angling pressure and increased boat traffic were to blame, while others believed weather conditions and food sources are the impetus to population shifts:

“[There are} less fish, but dey are still here. Just dat pressure on da flat will push da fish in a little deeper water or someting like dat.” (Ornaol Greene).



“...dere's more guides fishin da area, so dere's a lot of pressure on da fish, dey move around. (Ronnie Smith, lodge chef).

“Da problem we gat now even wit da bonefish, da bonefish are not along da shore like dey was years ago, because we have too much, many boat trafficking, an dat nervous water, wake water along da shoreline. It sterilize dem and dey goes in da deep. Wit me goin bonefishin now, I don't fish along da shore, I fish in da deep. A lot of guides, dey go an set an dey lookin along shore, but da fish aint along da shore fish, dey out in da deep.” (Ralph Moxey).

“I don't think it's angling pressure, it's weather conditions and food sources, the fish move around.” (Drex Rolle).

According to some guides, environmental changes are impacting bonefish population levels and their movements. Warmer water earlier in the spring and later in the fall, along with more frequent weather fronts and storms may be forcing fish into deeper water. In conclusion, it seems several factors in combination are impacting bonefish population, movement and habitat throughout The Bahamas. The fact that 47.5% of all guides interviewed reported declines in bonefish numbers is a concerning issue for long-term sustainability of the fishery.

### **5.3 Perceived tarpon (*Megalops atlanticus*) population changes**

Anglers travelling to The Bahamas to flats fish have historically targeted abundant and large bonefish, although tarpon and permit can also be caught (Davis, 2017, Fitzgerald, 2017). The Bahamas as an angling destination is not well known for tarpon or permit, as populations of both species are perceived to be low, and habitats insufficient to support higher numbers (David, 2017). This in addition to selective species targeting of bonefish, may have resulted in reduced understanding of tarpon and permit habits and habitats.

A few guides highlighted these facts during interviews, explaining that a recent preferential shift in angling focus, is forcing guides to re-examine local fisheries with the intent of catching more tarpon and permit. Some guides identify increased sightings of tarpon [and permit] as a function of increased attention to these species:

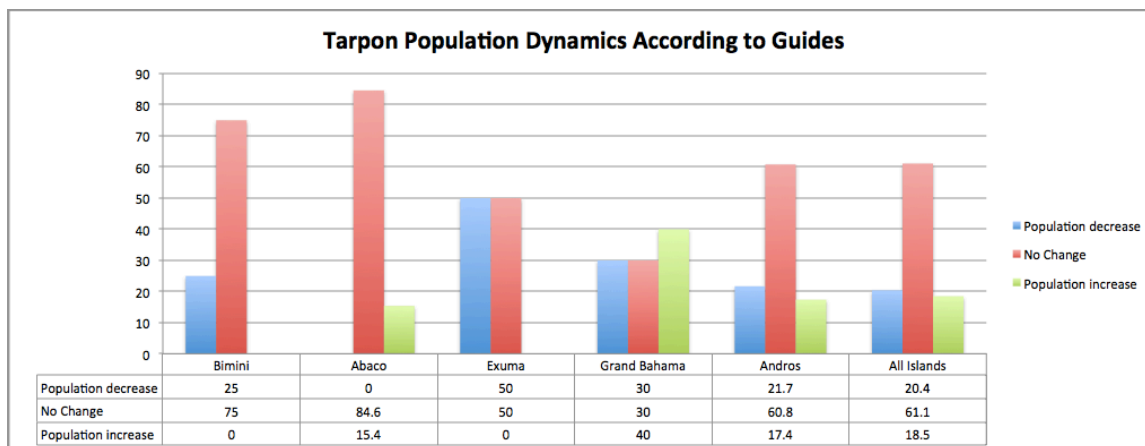
“We really never focused on tarpon, it was always bonefish so it wasn't dat we were really lookin for dem to say how much it is, or how rough it is. Back den, it was just strictly bonefishin. I just look for bones you know what I mean? So if I saw a tarpon, it wasn't like dere were one, or two, or three, or four, it wasn't what we were lookin for.” (David Russel Jr.).

“Well dere ain't much of people fishin for tarpon, not in my area, I don't know about over here. Only a few people will come, I'll say about 20 in Sout Andros. I don't know about North Andros. You have about 20, maybe not even 20% of da people come to fish for tarpon, everybody Bonefish.” (Stanley Forbes).

“When I first started out, maybe because I was not lookin for them... and now that since a lot of people ask, "Doug I need to tarpon fish, do you see any tarpon, do you see any permit?" Now my eyes are more open and I'm seeing more tarpon than before.” (Douglas Saunders).

Fifty-four guides provided feedback on tarpon populations. Fewer guides provided feedback on tarpon because tarpon are sparse throughout The Bahamas except for on Andros where more suitable habitats exist. A majority (61%) of these respondents reported no change, 20.4% reported a decline, and 18.5% identified increases (See Figure 8). There does appear to be inter-island variability with these responses.

Figure 8. Perceived tarpon (*Megalops atlanticus*) population changes regardless of years of guiding experience (n=54). More specifically, all elder guides perceive a decline in tarpon numbers except for one elder guide from Bimini who observed no change. This individual noted a steady but low population of tarpon.



Roughly 85% of guides on Abaco perceived no changes in the tarpon population, while 15% reported increases. On Andros, 22% reported a decline, 61% reported no change, and 17% reported an increase. 75% of guides on Bimini reported the population has experienced no change, while 25% reported a decline. On Exuma, 50% reported declines, and the remaining 50% reported no change. Finally, on Grand Bahama, results are more equally divided: 30% reported declines, 30% saw no change, and 40% reported increases.

### 5.3.1 Tarpon Decline

According to guides, several factors affect tarpon populations including, extraction, storms, insufficient habitat and netting of baitfish (*Mugilidae sp.*, mullet). Elders who observed declines in tarpon, recalled tarpon scales being sold as souvenirs to tourists while others attributed population declines to intense storms:

“Dey [tourists] use to just collect Dem. In da beginnin before guests come to catch bonefish, we use to just catch da tarpon [and bonefish] and get deir scales to sell dem sometimes.” (David Pinder Sr.).

“Well I tink because of da storms. Da area are so shallow I tink da storm get rid of a lot of da fish.” (Ralph Moxey).

Another guide acknowledging a decrease in tarpon explained that tarpon are migrating more, shifting from known angling spots to unknown locations. He did not speculate on the cause of shifts.

“...da fish are migratin sout, but we don't know which destination. Da fish even from Florida, dey're movin sout. Now Florida still has tons of tarpon, but da fish are migratin, you could see it on da west coast, dey're migratin sout but we don't know where too yet. We have a lot of research to do here, do GPS, you know? Tracking device on dese fish an see where dey are headed. Now dey may be going up in dis place, on da southern tip of da island, place dey call ‘Lisoll’, or ‘Pure Gold’. Dey giant blue holes an big blue creeks, an nobody goes there.” (Charley Neymour).

Tarpon habitat deficiencies throughout The Bahamas were commonly referenced as a contributing factor to low tarpon numbers, and perceived consistent populations. According to guides, tarpon prefer brackish water, a mix of salt and freshwater, which is not commonly found in The Bahamas, as stated below: Andros however, is widely recognized in The Bahamas for abundance of freshwater, hence there is more brackish water, and according to guides, more tarpon.

“I think the condition for those guys [tarpon], are not...well definitely we don't have any brackish water at all.” (Joseph Pinder).

“Tarpon like more than anything, they like a little brackish water and brownish. Round here where the tarpon live is just clear you know white water, so is not real great tarpon country.” (Ansil Saunders).

“The reason why we don't have much tarpon, tarpon like brackish water and most of all water here is real salt.” (Nathanial Adams).

“We don't have brackish water for them to spawn. I bet they do breed, but because it's just the pure salt water very few of the eggs what make it.” (Jeffrey Pinder).

“Andros has a lot a tarpon on the west side.” (Ansil Saunders).

Two guides further elaborated explaining that a lack of brackish water as well as reduced forage fish have limited tarpon populations in The Bahamas:

“Well I never having saw much tarpon from da time I was guiding. Just occasionally, you might just stumble across one but we never had, I mean in da area I fish, I never, you know, I rarely saw tarpon. You know, dat brackish water we don't have dat ,it's all salt so you see dat could be one of the reasons and den a lot of people feel dey feed on mullet, but you don't see much mullets runnin around here either.” (Reno Rolle).

“For each year, you seein more and more, more and more on da flats. What has happened, when I was much younger dere use to be a lot more tarpons because dere were more mullets. But, da locals use to haul da mullet and eat dem, so you won't see as much mullets as like when I was growing up. I use to see big huge schools, but now da most I see is maybe like maybe like 20 or 30 in a pack. You don't see da big huge schools anymore. I tink dat's what really caused da tarpons to really drop away but now da mullets dem droppin back in, so at least you seein more tarpons.” (Harlon Sands).

Despite the lack of brackish water, an identified necessity for tarpon, some guides recognized consistent areas within their guiding territory that hold tarpon. According to some respondents, seasonal variability is a factor in tarpon abundance, even in areas that consistently have tarpon. These preferred locations are deeper cuts, close to deep water and mangroves where fish have security and cooler water (notes):

“Tarpon, there's a few spots that you can usually go, I think they actually migrate here, I don't think they're resident because, you go there like certain months and they won't be there, like around March or April you find a few of them but I think they're more migratory.” (Travis Sands).

“we see dem more in da summer simply because probably da rain make brackish water.” (Alvin Greene).

### 5.3.2 Tarpon Population Increase

Roughly (18.5%) of guides indicated tarpon populations have risen. Some noted this may simply be due to the fact that guides are looking for tarpon more, to satisfy shifting angling preferences:

“Everybody's looking for that 10 pound fish [bonefish]. Everybody that comes down here is looking for that 10 pound fish, they're not looking for permit, they're not looking for tarpon, they looking for that ten-pound bonefish that the island [Andros] is known for, but there a lot of big tarpon and permit here.” (David Neymour).

“When I began guidin it was just a matter of finding them. It was still an exploration of phase for me to find them on my own. Now I can just go to certain points [and find], 150 to 200 tarpon everyday. I can get you in the blue hole and you can get a tarpon automatic everyday, so it is a matter of just knowing the area and just getting to that specific area.” (Shawn Leadon).

One guide suggested angling pressure towards tarpon would increase as more anglers become aware of good tarpon angling opportunities on his island (Andros). He believed future populations may be at risk:

“...it's only a matter of time before people experience or find out that these tarpon or permit are here, and they going to be fishing, and fishing it hard.” (David Neymour).

Human developments on Exuma, Bimini and Grand Bahama were noted as preferred tarpon habitats because of access to deeper water. It is possible that future developments providing deep water may increase local tarpon populations throughout the islands if observations and assumptions made by guides are accurate:

“I guess da habitat isn't good for dem, you know da area where dey could really live, other dan by da bridges an certain areas in da mangroves. For some reason they're just not plentiful.” (Drex Rolle).

“I mean you know, under the bridge is a like a big manmade canal that go right through the island. Tarpon always in there.” (Joseph Pinder).

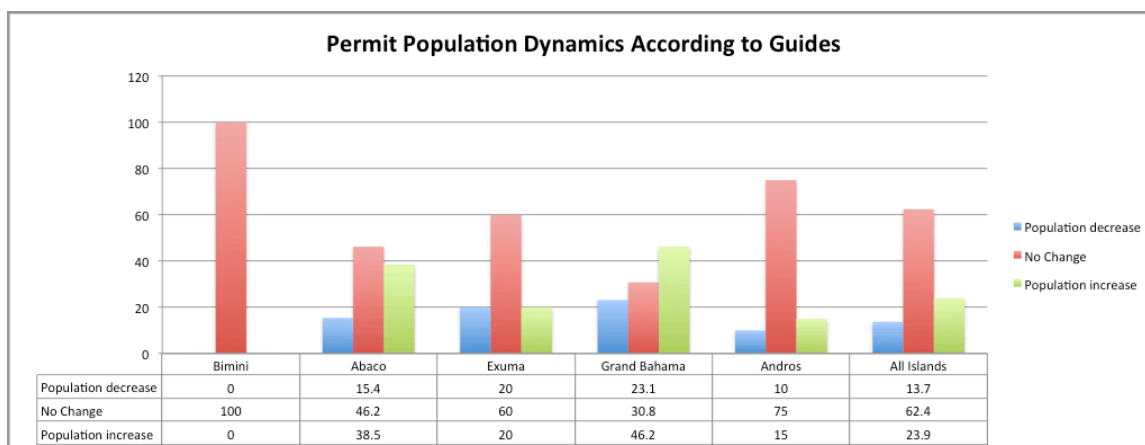
“Maybe a little bit more of them [tarpo] cus now I've seen like, the other day I saw 9 up to the north end of the island. Most of them hang around the docks and when you find the young ones they're usually over in the canals over in South Bimini. When you find the young ones over there they got the water run off the fresh water run-off in the canals and that must be where the females lay their eggs and stuff like that, because that's the only time you find a small one over in the back canals. The bigger ones hang around the dock from like thirty, forty pounds, maybe to a hundred pounds or so. You'll find them up to Resort World, you'll find them around the marinas.” (Tommy Sewell).

Perceived consistent tarpon populations noted by the majority of guides bode well for industry sustainability. While tarpon appear to be a secondary target species throughout the Bahamian flats fishing industry, there are guides who claim that tarpon are available in abundance, and that angling for them is on the rise. The impact of increased angling effort towards Bahamian tarpon is unknown but it is reasonable to assume populations will react.

#### **5.4 Perceived permit (*Trachinotus falcatus*) population changes.**

Overall, 13.7% of all guides (N= 55), reported declines in the population of permit, 62.4% perceived no changes, and 23.9% noted increases. Inter-island variability between respondents exists suggesting altered habitats and localized stresses may impact populations over time (See Figure 9).

Figure 9 - Perceived permit (*Trachinotus falcatus*) population changes regardless of years of guiding experience (N=55). More specifically, all elder guides identified no change to permit populations.



#### 5.4.1 Permit Declines

There is little consensus among respondents as to potential causes of permit decline, but 13.7% agree there has been a decline. Guides on Abaco, Andros, Exuma and Grand Bahama reporting a decline in permit, are elder guides with more than 40 years experience. Only guides on Bimini reported no change in permit prevalence.

“Its less. I mean, back in da old days, we use to see tarpon and permit, I mean like covering da flats. Like right now, I don’t really know what is da cause of it, why we’re not seein bigger fish, but back in da old days, we always run up, pull up on a tarpon, or a permit just cruisin right along da flats. I have to look into dat to really... to get some feedback on why we not seein bigger permit or as many on da flats.” (Carl Rolle).

Of the guides identifying a decline in permit population, only netting is noted as a cause of the decline, as stated below:

“It has dropped pretty quickly because they used to net them. Sometime you see one comin here though, to have babies.” (Maitland Lowe).

“I tink dat happened a little more gradually den how da bonefish did...da guys used to net dem. I know dat was some of da reasons why we really don't have as many permit as we use to have, da guys net dem.” (O’Donald McIntosh).



If netting is the cause of permit population decline, permit numbers should presumably be growing because of the 1987-netting ban (Bahamas, 2017d.). Guides attribute the netting ban with improving bonefish stocks, and it is a reasonable assumption that the ban would have similar positive effects on other species, including permit. Other variables affecting permit populations may exist, but the vast majority of the guides, with the exception of one, reported no probable causes:

“Yes I can say so...I could have put aside days where it was calm and smooth and you would say okay I'm going to Jacob's Cay to fish for permit today, and guaranteed, you'd find dose permit. Now you go dere, da permit might still be dere not da amount, but da ones dat are dere are more spookier, an more shyer because you got da lobster fisherman zoomin over da banks, and conch fisherman zoomin over the banks.” (Leroy Glington).

This response highlights anthropogenic impacts negatively impacting angling. This form of environmental impact will be elaborated on in Chapter 6.

#### **5.4.2 Challenges to Permit Population Assumptions**

According to interviewees, permit prefer deeper water than bonefish, with strong current, and a hard bottom. They also prefer more windy conditions. These factors make permit more challenging to find and see:

“What permits really look for, we don't have as much in here on Andros, I can't really speak for the other Islands, but on Andros we have more muddy flats and to me the permit sort of like rocky flats, and they like more deeper areas along the ocean.” (Alvin Greene).

“Permit are not as slender and narrow as bonefish, they need a lot water. So what they does is they would come out of deep channels on high tide. They follow the tide and so most permit fishing is good with a big tide because they can come out of the channel and up on to the flat...” (Meko Glington).

“Well I know this particular area where they hang out, they like the very corally bottom for some reason.” (Jeffrey Pinder).

“They like that windy weather. When it’s calm, you would go out there, and when you find a permit when it’s calm, it will be noted, . They will run and they like windy weather. I gone out there on the big flats, we call this the big flats out there in the back of these mangroves.” (Fred Rolle).

Conversely bonefish tolerate shallower water, preferring soft substrates for foraging. It appears that because of selective targeting of bonefish, guides have excelled in bonefishing, but not necessarily permit fishing. Bonefish guides may have less knowledge of permit habits because they are found in different habitats, and have historically focused on bonefishing. However, due to angler preference shifts, there are more anglers seeking permit (Davis, 2017). Guides now consciously seeking permit, may attribute sightings to increases in populations, simply because they observe more of them, as stated by some guides:

“It [the population of permit] wasn't actually lower. Let me tell you, the permit were there but I didn't know how to look for them. They were there you see. I'm getting smarter, at how to find em, where to look. They were always there. Some days, I go on the west side I count 15 permit, 10 permit, you know? People say there are no permit in The Bahamas like Mexico, but I think there are, you just have to.... everybody is fishing bonefish you know?” (Ornold Greene).

“I have seen permit a lot. Last year I saw the most permit I've ever seen in my life. Between July to the end of November I probably saw roughly a thousand permit, schools of 20 to 30 multiple times a day, lots of them. This year I did not see as many permit. I would say overall the permit population has come up from when I started guiding, because I'm looking for them now. A lot of guides are not necessarily looking for them they're looking for Bonefish. They're looking on the tides for those bonefish and then all of the sudden you got that permit! I have seen giant permit 40 to 50 pound permit, in open water in schools. We have good numbers of permit here and it's just dialing them in. (Thomas Albury).

“In da beginning nobody was targeting da permit, but now people are targeting da permit and tryin to find destinations outside of their usual destinations. So yeah, a lot of people come now and start target permit. When I first started, permit was probably unheard of other dan from Florida.....We're lookin for oceanfront

places, we're lookin for little atolls, rocky atolls off on da oceanfront, on da eastern coast of da island. Big Wood Cay, all the eastern coast got it. We rarely tag a lot of permit in da bights [where bonefishing is rich], you might by surprise come across one or two in da bights but usually, on da oceanfront. Now people have been targetin dat Williams Island area, which is going to become very, very, popular in da future because dere's tons of to permit dere.” (David Neymour).

“I think it's fair to say for almost every guide on Abaco, the change [in population], is not the fish, it is the fisherman. Our guides today all of them, those guides that have been fishing for 25 or 30 years and those that are younger, all of them have changed their technique and their understanding of the fish and the fishery. I think we are looking for the fish now, understanding the fish better. I believe anecdotally the fish have been here the whole time but most permit that we've caught here before were while you were bonefishing on a high tide, ‘here comes the permit’. We don't fish for the fish like that anymore. We fish for them very differently, very specifically. We have very specific flies for the fish, it is a totally different game and knowing what I know about the local fishery here from my guides from Sandy Point and the rest of it, we have probably got more permit landed, more permit in the last few years. Collectively most of these guides have not caught a lot of permit so I think the change has definitely not been in the fishery it has been in the fisherman and the guides. So although I've not fished everywhere in the world, our clients have, particularly the permit fisherman, and I think they would all say that hands down the biggest fish in the world they have ever seen are here, the hardest fish to catch, here. Occasionally we'll see school fish, smaller fish but most of the time they are singles, doubles, big fish 30 + [lbs. +], and we have had fish to the boat pictures, of them but not holding them, that would definitely be world record fish by world-class anglers.” (Clint Kemp).

The fact that guides are looking more for permit, may explain why they are seeing more permit, or why they did not see them before. This may lead to perceptions that permit populations were low, or are increasing, simply because of shifted focus. These results challenge local knowledge viability, illustrating how false assumptions may originate. In any event, increased angling pressure directed towards permit, may affect future sustainability of the fishery as angler preferences shift.

While the guides quoted above explained increased permit numbers as a function of increased angling pressure, there are other guides on Grand Bahama and

Abaco who consider increases in permit numbers as natural irrespective of changes in angling preference. To these guides, permit are increasingly occupying known bonefish habitats. They are seeing more permit in areas traditionally fished for bonefish thus they conclude permit populations are rising.

“Well me especially, I've been seein permit every day for da last 4 or 5 days, down sout here. So I would say you can see a permit almost every day not even lookin for dem, just by pollin bonefish flats.” (Samuel Mackie).

These observations may indicate shifts in permit populations to typical bonefish flats, or an actual increase in permit.

#### **5.4.3 Permit Population Increase**

Almost a quarter (23.9%) of all guides reported increases in permit populations; some for reasons mentioned above, others for the fact that they believe there are actually more permit. Those noting increased permit populations, and speculating on a cause, all attribute the changes to more frequent strong weather patterns:

“I think about two years ago in the marls, where we fish mostly, we have seen more permit, right through the season than what we've seen three - four years ago. I think we see more recently. They're showin up in the same area more. You're lookin at that point and we've seen more in that area than I believe in the last 2 years than I've seen the last 4 years before that.” (Donnie Lowe).

“I'll say da past year, all da guides pretty much say we tink we've been seein more permit dat we ever seen. So da numbers of da permit really came up, I mean even right out here [on a bonefish flat].” (Joseph Pinder).

“Now a days, I don't know what causes it, once you anywhere up in da eastern area, you could see a permit on any given day, any time a da year. But when I first stared working here, after like May, you go forget [trying to catch] permit [they are gone].” (Mervin Thomas).

“I don't know, I mean, we see your odd permit before, but now you see a lot more. We've always seen some permit on the south, it's a fish we don't fish that much because you know it's on the ocean, big waves in it. It's only fishable when calm, but on the north side we started seeing more. We started to see fish

consistently of smaller sizes. We do have some huge permit here that sorta wonder around. I'm pretty sure I saw a permit with a tag in it this year, which is interesting....And it seems to be more consistent as the year, over the summer. We were not sure whether it was gonna be a consistent thing or whether it's gonna be not a consistent thing. I've been out there and seen schools of forty permit, from forty pounds down to ten. You don't see that all the time, but every now and then you'll see that and you'll think well where the hell did they all come from? What are they doing, and where have they been? What have they been doing, and where are they, and why are they there? If you talk to the old timers here, they'd tell you there was more permit here back in the day, but if you were to put a gun to my head and force me to come up with reason why? Seven to eight years ago, or seven to nine years ago, somewhere in that area, every year for three or four years we had very strong westerly winds that came across. With these strong persistent west winds that would go on for weeks at a time, my theory is that it seem to coincide with a lot of juvenile or you know, larvae or whatever the stage of the permit. They got pushed across the Gulf Stream and then it inhabited both the Grand Bahama Bank and the Little Bahama Bank, with the new stock of juveniles.” (Jason Franklin).

“After a storm, you know a tropical storm or a big hurricane, a lot of permits come. I don't know if dey come from da ocean, or out of da blue holes, but just after a storm, about 2 or 3 days after a storm when dat mud started move away, da permit be all over da place.” (Stanley Glington).

Apart from a possible relationship between permit population and storms, most guides had few suggestions as to likely causes for increased permit numbers. One guide mentioned that he observed more permit in warm summer months and had seen more permit recently because his local waters warm more quickly and stay warm longer. This ties to climate change threats noted by guides (see Chapter 6):

“When I first started to guide every now and then I used to see some, but the numbers it's just exploding, especially at the warm time in the summer which is longer, or late spring and summertime. Oh man you're seeing... I would say in the last five years, we've seen a big increase.” (Riccardo Burrows).

Although elder guides overwhelmingly reported declines in permit populations, the majority of guides reported stable or growing populations. These observations imply sustainability of permit fishing in The Bahamas. However as noted, permit have

been a secondary target species in The Bahamas, therefore guide knowledge of their actual population may be less accurate than similar assessments of bonefish numbers. Additionally, impacts of increased angling pressure on permit are unknown. As noted, one respondent explained permit become increasingly weary with angling pressure, and another stated areas that are known permit habitats will face increasing pressure as angler preferences shift. Apart from angling pressure, permit populations in The Bahamas will face other threats including development. One respondent explained a localized environmental threat that will impact local permit populations. He was the only guide to speculate on future permit population health, relating development pressures to potential decline in stocks:

“One of da places dat we need to really be careful of and look carefully at is Burroughs Cay. Dat's one of da only spawnin ground up in dis area now for permit. Dey have people talkin about going up dere and gettin aragonite. If dey start dat dredgin up dere, dat's it, da permit population will be gone.” (Stanley Ginton).

The challenges associated with assessing permit populations when species specific targeting of bonefish has been the norm, detracts from clarity and accuracy of these results. If the 86.3% of guides reporting no change or an increase in permit are to be assumed correct in their assessment, then permit populations in The Bahamas may be considered stable until conditions change. If angling pressure for permit increases, as some guides predict, future sustainability of permit angling in The Bahamas may come into question, as some pointed out.

## **6. Results 3**

### **6.1 Threats to Bahamian Flats Fishing and the Role of Guides in Management of these Resources.**

This chapter examines how Bahamian guides' understandings of contemporary changes in the recreational angling industry can potentially inform sustainable resource management policies in The Bahamas. To address this issue, an open-ended question was asked allowing interviewees to reflect on current local conditions, and potential threats impacting the industry.

Interviews with guides revealed a total of 173 different threats to the bonefishing tourism sector. The reported threats were classified into nine broad categories. These categories include: 1) attrition and insufficient replacement, 2) consultation, 3) netting and over fishing, 4) angling pressure, 5) government, 6) development, 7) environmental decline and changes, 8) poaching, and 9) technology. Each of these categories is broken down to specific threats, and corresponding frequency of responses (Table 5). Respondents commonly identified threats similar in nature hence 'sub threats' have been merged and categorized accordingly. For example category 7, identified as Environmental Decline and Changes, which includes mention of habitat loss, garbage on the flats, pollution, radiation, turtle increases, shark increases and Navy submarine blasting. Some sub threats fit into other categories, and responses often present multiple threats potentially fitting into other categories.

Table 5. Identified threats to the future of The Bahamas bonefishing industry.

| <b><u>Perceived Threats to Bahamian Flats Fishing (n=76)</u></b> |                            |                         |  |
|------------------------------------------------------------------|----------------------------|-------------------------|--|
| <b>Threat Noted</b>                                              | <b>Number of Responses</b> | <b>Percent of Total</b> |  |
| <b>Angling Pressure</b>                                          |                            |                         |  |
| Angling Pressure                                                 | 21                         |                         |  |
| Population Decline                                               | 7                          |                         |  |
| Population Movement                                              | 16                         |                         |  |
| Catch & Release                                                  | 8                          | 34.1                    |  |
| Handling                                                         | 5                          |                         |  |
| Predation – Sharks/Barracuda                                     | 2                          |                         |  |
| <b>Attrition and Insufficient Replacement of Guides</b>          |                            |                         |  |
| Attrition and Insufficient Replacement                           | 31                         |                         |  |
| Maintaining Professionalism                                      | 1                          | 20.2                    |  |
| Guide Training                                                   | 3                          |                         |  |
| <b>Development</b>                                               |                            |                         |  |
| Development                                                      | 8                          |                         |  |
| Jet Skis                                                         | 5                          |                         |  |
| Airboats                                                         | 2                          | 12.7                    |  |
| Competition                                                      | 3                          |                         |  |
| Cuba                                                             | 4                          |                         |  |
| <b>Poaching</b>                                                  |                            |                         |  |
| Poaching                                                         | 2                          |                         |  |
| Bonefish as Bait                                                 | 1                          | 9.2                     |  |
| Fish Pots                                                        | 3                          |                         |  |
| Dominican Poachers                                               | 10                         |                         |  |
| <b>Netting and Over Fishing</b>                                  |                            |                         |  |
| Netting/Over Fishing                                             | 13                         | 8.1                     |  |
| Conch Shells                                                     | 1                          |                         |  |
| <b>Environmental Decline and Changes</b>                         |                            |                         |  |
| Environmental Decline and Changes                                | 0                          |                         |  |
| Pollution                                                        | 1                          |                         |  |
| Radiation                                                        | 1                          |                         |  |
| U.S. Navy Testing                                                | 1                          | 6.3                     |  |
| Habitat Loss                                                     | 5                          |                         |  |
| Hurricanes                                                       | 10                         |                         |  |
| Turtles                                                          | 1                          |                         |  |
| Garbage                                                          | 2                          |                         |  |
| <b>Government Inaction</b>                                       |                            |                         |  |
| Government Inaction                                              | 3                          |                         |  |
| Angling Legislation                                              | 5                          | 5.8                     |  |
| DIY Angling                                                      | 2                          |                         |  |
| <b>Technology</b>                                                |                            |                         |  |
| Mother Ships                                                     | 4                          | 2.9                     |  |
| Hand Held GPS                                                    | 1                          |                         |  |
| <b>Consultation</b>                                              |                            |                         |  |
| Lack of Participation Opportunities in Decision-Making           | 1                          | 0.6                     |  |



### 6.1.2 Angling Pressure

Angling pressure and changes in the fishery were the most frequently (34%) mentioned threats. This category omits netting or commercial over fishing interview comments, and focuses on the recreational angling impact. References were made to excessive angling pressure (36%), bonefish population declines (12%), bonefish population shifts (27%), catch and release concerns (13.6%), fish handling (8.5%) and increased predation (3.3%). Because the preceding chapter covered generalized perceived changes in bonefish, tarpon and permit populations, the focus here is on noted causes of change like catch and release issues, fish handling concerns, and increased predation.

While catch and release angling practices are intended to be a conservation tool, some guides identified catch and release as a factor in declining bonefish numbers. Catch and release as the name implies involves anglers catching and then releasing a fish. Anglers may have to deal with deeply hooked fish or they may remove the fish from the water for a photograph. Improper handling, excessive exposure to air, deep hooking, poor angling technique, insufficient angling gear and general post-fight fatigue, were all cited as issues with catch and release practices, as stated below:

“...some people, dey would catch dem and hold dem [bonefish] too long, now when dey release, dey still die.”(Harry Rolle).

“I think the catch and release is killin dem. When da fish lose da slime because dey are handled, dey are more easily caught by sharks and eaten.” (David Pinder Sr.).

“I don’t believe none of dem live, cuz of the barracuda.” (Jeffrey Ferguson).

“Well I tink da most eat by shark, most eat by shark, only a few of dem survive. Like I say, I remember I went out, I had my fly rod and I catch a good bonefish.

I bring him home and when I clean him, all trough him was clot of blood, and so dat tell me dat when you catch dose fish on dese fly rod, he's break up inside. All dose clots of blood in dem., dey can't make it. So dat's my view about da fish, dey should have a limit about how much fish dey could catch nowadays, an dat may help da situation, rather dan everybody going out there and catchin just as long as da fish biten, you just catch, you just catch. Have a limit a day, like dey have wit da pigeon or any other ting like in a shooter sport, and so I tink da bonefish should come to dat.” (Thomas Mackie).

Post release mortality by sharks and barracuda was a common concern of guides. They also noted improper fish handling and catch and release practices as causes of increased predation. Ten guides, primarily from Andros, raised the issue of fish ‘slime’ removal from improper handling, affecting post release success levels.

“Da slime dat you see on your hand, dat is their lifeline.... It take about 40 minutes in order for dat to get back on their skin, so within dat [time period], dey're movin a little slowly [and] da barracuda has a good chance to take control.” (Nelson Leadon).

“...when the fish lose the slime because they are handled, they are more easily caught by sharks [predators] and eaten” (David Pinder).

“...the less you can touch the fish, you know if you don't have to touch a fish, don't touch it, just get the leader in, hook this [pliers] in, and get it off. You don't have to take that protective slime off the fish.” (Phillip Rolle).

“What happens is da shark or da Barracuda would eat dem because dey don't have da strength to get out of da way, [they are] easy cuz once you touch dem you take da slime off and you slow dem down cuz da slime is what makes dem give dem da speed.” (Rudolph ‘Timer’ Coakley).

Other guides, specially from Andros suggested catch and release aids be used to help ensure fish are kept submerged while minimizing angler handling, as stated below:

“Well sometimes we [the guides] do huddle, and we talked, we talk about tings like dat, dis is one of da ways dat we're going to reach them [angers] too... by lettin them know about a de-hooker, trying not to touch da bones [bonefish] and that's some of da ways that you could try to educate them [anglers] as well. Some simple tings dat you can do, some guides go in da boat and dey see da results of da tings dat you're talking about, if you touch a bone, a bone will come up on da water because he is tired, it'll be floating. A shark will come right

up and boom, he'll get it. So what we try to do is talk to da guides and say, "if you can, try to use a de-hooker", it's not saying dat dat guide is not a good guide, it's not sayin dat da guide is not a professional guide, but dat's just one of da arsenal, he just need to add to his repertoire to make him dat much better." (Douglas Saunders).

"it's just a matter of protecting them like I say handling them right. If you don't have to touch them, release them with a de hooker, you know that protects them because then... it's like you basically, someone taking you running, you a five mile raise and then sticking your head under the water." (Leslie Greene).

"...you just use da pliers, if you don't need a picture, just pliers to da bonefish, take da fly out of his mouth and he's good to go." (Ronnie Bain).

"...if you want to catch and release to save da fish, you need pliers, and needle nose pliers dat you pull da fish to da boat so far, and put da pliers down. I need a break da line or unhook it, but don't touch it [the fish], if you want [the fish] to live don't touch it, if you touch it, shark [predators] gonna eat it." (Ralph Moxey).

### **6.1.3 Catch and release successes**

When guides were asked what number of bonefish out of 10 fish that were caught and released would survive, they responded with rates as high as 10 and as low as 0. Some guides noted success of catch and release was regionally variable due to localized predator populations, and access to protective mangrove shorelines. Others recognized the importance of appropriate gear, proper handling and release techniques, with no human to fish contact being preferred:

"If you release them properly, I don't think they get caught." (Donnie Lowe).

"...in my area we try to protect them as much as possible, we got to try to keep as much of them alive as possible because if you handle them wrong, beat dem around, throw dem about, and you don't respect the fish and appreciate the fish, you will lose da fish. Dat's just da way it is, you've got to protect dem as much as possible....If dose fish get to da point where they're too tired, and you know da sharks could dial in on dem from long way away. Let's say I catch five fish on dat flat, probably one or two might be gone to sharks or barracudas." (Leslie Greene).

“Sharks do follow you around, but on release, you don’t just chuck them in. You try to revive them a little and then watch them swim away. [You] try to protect them a little, because in their distressed mode the sharks and cudas will move right in...once you handle that properly, [I think] 80% will survive.” (Drex Rolle).

“Different areas different circumstances I fish primarily on the east side of Abaco, more the ocean fishing. You have a little bit bigger fish, it is totally different than the marls side of Abaco. On the marls side of Abaco I've had plenty of fish eaten by predators sharks are barracudas. On this side [the east side], I have never had one fish that I've actually seen get eaten. I don't know if it's just the difference in the water or just bigger water not as condensed. I would like to think that most of them, I'd like to say 90% of them are getting away especially on the east side - on that side I might go down as far as to say 60%, 60, 40 deal.” (Thomas Albury).

Although one guide felt post-release mortality as a result of predation could be completely eliminated, over 70% of the guides believe predation related post-release mortality exceeds 40%. The majority (over 50%) of guides indicated they felt at least 50% of released fish are predated by either sharks or barracuda, hence the noted concerns about proper fish handling practices. Some guides made mention of improved angler practice, of using do-hooking tools and of guide education. This was most common on Andros. Assessing potential decline in the population of bonefish is only done through assessing population changes in bonefish, a leading research question addressed in Chapter 5. However, post release predation is a major concern with guides, so examining shark and barracuda populations, is warranted.

#### **6.1.4 Predators**

Barracuda were commonly cited as an issue affecting bonefish populations through post-release predation. Roughly, 17% of guides indicated an increase in

barracuda populations, 36% noted declines, while 54% indicated little change but with consistent high populations. Guides noted population increases with comments like:

“Dey getting more, more dan ever, very high” (RBA15INT).

“To me da barracudas population is growin, like da bones but da cuda [barracuda] seems to be comin from out deep, and comin into da flats and as much as we could catch, dey still comin in there and dey lookin for food to eat, bonefish to eat. Where there is a big group of bones, there are barracuda. (Ronnie Bain).

Conversely, 36% noted declines in barracuda population as a result of increased angling pressure:

“So der didn’t use to be many people fishinen for dem, but now even da bonefishin guides, every one of da boat you see go out carry a rod, so dey can catch one wit bonefish too.” (O’Donal McIntosh)

“Dey put a big dent in it, every native tournament, dey takes hundreds of barracudas from round close to da shore here...” (Ansil Saunders),

“Da barracuda become a big menu in Nassau at da fish fry so people now all over da Bahamas, dey looking for barracudas, you understand? People consume all of dem... in Nassau you have on average fish fry night, average night you have 1500- 2000 people buying barracuda, and dat's every day, every day, every day.... you think about it. People are lookin for Barracuda all over, even up to Grassy Key is where nobody live, dey're up dere, they catchin barracudas, everybody all commercial boats, dey're bringin barracudas, barracudas, barracudas. (Charlie Neymour).

“When I was a little boy growing up, there was lots of Barracuda, compare to now so it was very high. A lot of Bahamians eat the Barracuda, we eat them so once we can catch them, we eat them.” (David Russel Jr.).

“The Barracuda has drastically decreased, because most guides, deep sea fisherman as well, Barracuda is a ting that hit anyting and when you catch a barracuda we don't release Barracuda back, Barracuda is not a catch and release fish, I tink that needs to be added to the list of endangered species now because at first you could catch anywhere from a five or six feet Barracuda, now today you can barely catch a two or two and a half feet one, so the big ones are really, you don't find those anymore, you got to go all the way south like about 40 miles sout to really get the big ones now.” (Douglas Saunders).

The majority of respondents (54%), however, indicated no changes in barracuda populations but noted current populations are “healthy”, or “very high”:

“Barracuda is everywhere, dey da same, no change. Barracuda is found in four inches of water or four miles deep, dey everywhere, dey deep, dey shallow, not so shallow.” (Ansil Saunders).

“Tons of barracuda, a very high population, dey always [been] here.” (Samual Mackie)

“Lot of barracuda, very high and no change in numbers”. (Herman Bain).

The other predatory species potentially affecting post release mortality are sharks. Shark extraction in The Bahamas was banned in 2011 (Bahamas, 2017b. and d.). 38 guides raised concerns about shark predation, while 83% of all guides interviewed identify increased shark populations, 14% recognize no changes in shark numbers but consistently high levels, and only one guide noted a decline in shark numbers:

“...there are too many sharks, the sharks are eatin up all da bonefish.” (Burnt Ferguson).

“more sharks than I have ever seen in my life.” (Clint Kemp).

“I think the shark population is definitely increased because of the food they've been receiving from,... I'll say from guides, or from people who are handling da bones [bonefish].” (Douglas Saunders).

“Sharks in da millions....da government has stopped you from killin dem.” (Maitland Lowe).

“very high numbers and there are more sharks now. Nobody [is] takin dem, there's plenty of food, dey just exploding.” (Ornald Greene).

“Yes [there are more sharks], well nobody is fishin sharks, da sharks is protected. Da cudas [barracuda] you can take home.” (Nathanial Adams).

“In speaking wit someone from da Nature Conservancy, she told me dey had a depletion, and I said, “I don't tink so, shark... is surplus... it's increasin”, because of da release, da fish release. Shark is a menace, dey too smart. See a shark is quicker to tame dan a German Shepherd, honest to God, he is quicker to tame dan a German Shepherd. If you pole your boat on dis flat tomorrow, release a fish bad.... dat's why I tell most clients, if da fish swallow da hook, cut it quick, cut it quick, don't dig up, choke up in his troat, it's gonna die you understand? Once a shark find dat out, he's gonna stay dere. Tomorrow mornin you reach dere, he's right back dere, den anther day, it becomes so tame dat when you stop on da flat, it will follow you, I mean dey're not moving, dey're waiting for you to hook a fish.” (Charlie Neymour).

It appears predators have become habituated to bonefishing practices, and now readily seek anglers and guides. This in conjunction with a ban on shark extraction, and a unanimous noted increase in shark population, challenges sustainability of the fishery if predation as a result of poor catch and release practice leads to significant declines on bonefish numbers. It also raises the question of the effectiveness of single-species protection measures.

#### **6.1.5 Attrition and Insufficient Replacement**

Attrition and insufficient replacement was recognized as a threat, and reported by 20% of all guides, making it the second most concerning threat identified. Threats identifying a lack of young guides, apprehension about maintaining a level or professionalism, and education or guide training, are all included in this category. Of these three sub categories, a concern over a lack of young guides represented 75% of the noted concerns. Education and training of guides and the public, represented 19% of noted concerns, while worry over maintaining standards represented 6% of the responses. It should be clarified here that results reported in Table xx reflect multiple mentions of these sub-categories.

One guide began by denying any threats toward the future of the fishery, saying he had no concerns about the industry because there would be no guides in the future to sustain the fishery. Perceived threats were pointless as a result of this fact. The statement was made in jest, illustrating the magnitude of the threat that he actually felt was very distressing:

“da reason why, it may sound jokey or funny. Da reason why I'm not worried about it is, soon dere won't be no guides, I'm tellin you, it's a serous ting. Da government need right now, da central government itself, to look at now, how can we, what legislation we could bring into place, in terms of bringin guides here either from Florida, from Cuba, you know Mexico. We need a way of bringing guides in. I'm tellin you, in da past few years you had BB died, you had EB died, you had RB died, you had EM died, you had CM died [prominent long-time guides]. I mean you, you could just go on, and on, and on. Da only person in terms of coming in, in dat time was DN, so you keep havin dis major depletion, dey just keep droppin.” (Charlie Neymour).

At one time Bimini had roughly 30 guides, but now only four remain (Notes, 2015). Individuals from every island mentioned the issue of a lack of new guides.

“One of the reasons is most of them died out. Either they didn't, you know wellness and heath is one thing to taking care of yourself and of course in a community like Bimini with no medical doctor no hospital or such, we can't really address, nobody here to address your illness a lot of people just die out.” (Ashley Saunders, historian).

Many respondents stated young people are reluctant to enter this profession, noting poor work ethics, challenging working conditions, shifting societal focus toward information technology, societal pressures in The Bahamas to become doctors or lawyers (Notes, 2015, 2016, 2017), and lack of attractive earnings:

“Da kids don't want to do it, everyone stay on da computer. Too much tings to do on da computer I guess an dey just don't want to work.” (Eddie Bannister).

“Well da biggest concern I have is da fact that we're goin to have to somehow, someway get fresh new blood into it. Da guiding industry itself is a problem for da fact that you have to.... it takes a long time to train a guy to become a good



guide and a lot of the guides are, every good guide is over 40 you know? You don't have new guides in da 18 and 20's right now and that's a big gap. We gotta urgently find guy's to fill that spot, cuz you know another 10-15 years, a lot of da guides are going to slow down. Dat is my main concern.” (Frankie Neymour).

“They say it is too much work and not enough money. ‘I could pole that boat all day’, they say, ‘it is too much work’.” (Maitland Lowe).

“...the young people, they don't want to work. They like to get paid, but they don't want to have to work. See, and dat....dat's what's going to cause the workforce to go down, if dey don't change their way.” (Rudolph ‘Timer’ Coakley).

“lack of interest... basically in at the age of technology.... everybody's not interested in being up there in the boat, they would prefer to be in the field where they into computers or something like that.... nobody's into hard work anymore... so trying to get these young guys to come up, you know I tried..... we tried to push it in the schools, tried to push it everywhere but.... they've been in the boat, we've trained numerous guides have been trained, but they get them to get in the boat, and stick with it.... it takes a lot of discipline to really budget finances, when you only work seven months of the year so the rest of the time you're sitting down doing nothing. if you don't have something to substitute for that, then you're going to be a poor guide (laughing)... somewhat like a starving artist, you really in this business because love of the business not really for the love of money because a lot of people who starred in the business for the love of money don't survive.... you gotta come from a good strong family background of guides and you got to love it, because you're not going to stick with it.” (David Neymour).

At present in order to be employed in The Bahamas, workers must either be Bahamian citizens, or they must acquire work permits. Work permits are not granted for bonefishing, a measure to protect the Bahamian guides. (PSA24NOTES). Some guides explained they were trying to train their children to be guides, with limited success:

“I'm 39. We [talking about one of the other guides] are the two youngest guides on the island and if you go 20 years from now, I don't think we're going to have the next guide that we can a train... I think this summer I plan to train my son.” (Reno Rolle).

“I try to have two of my sons who have tried it. I've taken them out on the water with me, and you know I tried to see if they would fall in love with it because you got to love it, to do it. But they just laying on the back of the boat going to sleep, that don't work, I mean no interest in it at all....none.” (Riccardo Burrows).

Despite the fact that 100% of the guides felt guiding was a good job, that the pay exceeds average Bahamian per capita GDP, and that it has passed through three generations in some families, there appears to be a deficiency in the number of young guides, and the problem is widespread. Re-examining the years of guiding experience on each island (see Chapter 4, Table 3), the average years of experience of guides on Abaco is 27.5 years, on Andros it is 29 years, on Bimini it is 41 years, on Exuma it is 24 years, and on Grand Bahama it is 31.4 years. Many guides went into the guiding profession after other careers, and will not be guiding much longer because of their age. Out of 71 guides, only three are individuals under the age of 30.

A need for training of guides was mentioned in 25% of the interviews, as stated below:

“I'm concerned about the lack of knowledge that the young guys have with bonefishin. Like they don't know anything about it and like there's nobody trying to get in it hard. Like the government don't get involved and tap into schools and don't let them know what bonefishin is about. We need young guides, and that's what I'm afraid of, there's not going to be anybody to replace the old guys because all the guides you know are old, they're getting burned out, and there's nobody to replace them. They're going to have to sort that out.” (Travis Sands).

“the government itself need to put da curriculum in da school”. (Eddie Bannister).

According to the guides, there is also a lack of understanding among the general Bahamian people about bonefish, bonefishing, and the importance of the fishery to island tourism. This may be a reason why the industry has not attracted new, younger

guides. Roughly 63% of the Bahamians reside in New Providence, (Bahamas, 2012), which is not a primary bonefishing destination. As one of guides stated:

“Nassau people don't have that big flare about bonefish like the Islanders, on Andros especially. They don't have that big flare. Very few of them know about bonefish. When I'm talking to persons they'll be like "wow, is bonefish like that?". I showed a few persons a bonefish picture and they said, "oh!", they were excited to see it. I showed them what a real bonefish look like out of the water and they went, "do you all eat that?" Yes we eat it, but it has a lot of bones, so most persons when they hear there's a lot of bones in it, they're afraid to go into it, to eat it.” (Shirley Leadon, former lodge owner).

When guides were asked how they would alleviate the knowledge deficiency around Bahamian bonefishing, comments suggest introducing it as part of general science curriculum in elementary and secondary curricula:

“I would target the schools, let them know what bonefishin is all about, what it's like. Then take them fishing, like let them experience it man. A lot of kids just stuck in home or on their phone nowadays, nobody gets out and says, "are we going to go fishing?" Everybody's all about technology now. Back when I was growing up, there wasn't too much technology, so I got into fishing hard, so yeah, a lot of guests they not into that anymore.” (David Neymour).

“We have to spend more time trying to educate the younger population about how important it is to keep that up you know? how valuable it is to this area, and the economy...It has to come, it has to be by the government. We have to ask the government to step in, and put it into the schools. It has to be done that way. There are children graduatin every year, children come out of school at grade twelve, they haven no idea what they want to do. Why would you want encourage them to leave the island, to go to Nassau, pay rent, do this do that, when you can just tell him hey, there's an industry here, that's been here for years. You could make a ton, a lot of money, you could sustain your family, everyting right here on this island without leaving the island, you don't have to pay rent, you could just do it right here. (David Neymour)

Commenting on the lack of new guides, four explained how they had personally trained guides and encouraged children and youth to learn about the profession:

“you need to train da young people from school. I would donate my time, I would take dem out on da flat free of cost because I've been doing dat. Once I could get a boat, I take dem out free of cost to let dem know what da fish is.” (Jeffrey Ferguson).

“When I have 1 guest, I'll take him [his young son] in the boat with us, that's how I trained all of my guides. When I have one client, I'll take a young guy who I am training in the boat with me, and let them listen and watch to see what I do. [I do this for], four or five trips, and then I'll take them alone, and I'll put them on the bow of the boat with a rod and I'll pole them. You can not be a good guide if you cannot cast, you've got to know what a fisherman needs, in order to be a good guide.” (Nathanial Adams).

Guide training is costly for independent guides and lodges, as stated below.

“...it costs something, it costs a lot to train a guide and in the meantime even though you're training him, they want to have something, they've got to be paid something and have some kind of incentive to go out there and really learn it. It costs because, like I say you're going to have to give the guys something for incentive, it's going to cost you fuel and whatever to take him out, to do whatever they need to do and if you have two or more guides, it's going to be taxing on a daily basis. You gonna have to eventually get them hours in the boat, and that takes a lot of time, a lot of time and I think there needs to be a program where you can train guides. If that can be arranged in someway or some how, it'll ease the burden on people like myself and some of the other guys who are interested in getting young guys into it.” (Frankie Neymour).

This added cost is presumably a deterrent to independent guides who lack sufficient financial resources to devote to training. With no secure repayment, training is costly and risky. Well-trained successful guides may be appropriated for alternative employment opportunities or seek self-employment:

“we have trained certain amount of guides, so many of them [have left]. American people like deals so some would get in wit da guides, if you've got a good guide, because you trust your guide, if da guide is not very savoury he will say, "now look, if you help me build a place, you got da guide[ing] free". So the fellow who got enough money, he says "okay", [and your trained guides leave]. (Samuel Raymond Mackie).

Some lodges had begun to offer bonefishing opportunities to local Bahamian children. These programs are designed to introduce children to bonefishing, give them some exposure to the outdoors, and give them incentive to become future guides. Out

of the 20 lodges visited for this research, this program was only mentioned at one lodge:

“A lot of time when we close for da summer we do classes an we try to help teach dem. Sometimes we have like 30, 30 kids. We use all da boats and carry, we carry 4 kids per boat. We go out for a half an hour and den we come back and take other crew out, until everyone has a chance. (Thomas Albury).

The University of The Bahamas’ Department of Public and Oral History, recognizing this knowledge gap problem, plans to develop school-aged curricular materials, as the following response suggests:

“the enterprise of educating Bahamian children is central to the work of any nation... if the fly fishing project proceeds as it already has done, and then on that same platform we will incorporate elements of the fly fishing project, to support teaching and learning in our schools... and that is the focus, curricular and associated recreational materials for children's from earliest years to 12th grade.” (Tracey Thompson, University of The Bahamas).

The Bahamas Ministry of Tourism, also recognizing the need for guide training, implemented a guide-training program in 2000, but the program has now ceased:

“Since the mid-1990s, we [the Ministry] had begun to pay specific focus on fly fishing as a market and then we examined it. In our examination we determined that depending on where you want the level of training, the level of capacity for the guides were up and down. So we wanted to ensure that there is uniformity between them. We began a training program back in 2000, that was geared towards things like customer service, geared towards how the angler was treated, how guides are able to use and utilize properly their equipment and so forth. We did it in Andros, we did it on Grand Bahama, we did it in Long Island, Exuma, so most of the major islands. It's a one-week course that covered something like 12 modules. Recently we brought in a consultant a couple of years ago that revamped the entire program because we wanted to ensure that we included some of the principles of sustainability, and so it's about to be re-launched, again that's one of the reasons we went to the International Development Bank. We wanted funding to re-launch the program and insure that it is done at an even higher level than it was done before. [The program ran] from 2000 to 2006, we had about a 150 guys that were officially trained.” (Benjamin Pratt, Bahamas Ministry of Tourism).

When asked why the program had ended, the respondent stated:

“In 2007 I got transferred as a tourism manager in Andros, so my responsibilities changed. In addition to that, we also wanted to, as I told you earlier, revamp the program so that it included some more sustainability principles.” (Benjamin Pratt, Bahamas Ministry of Tourism).).

As of 2017, the program has not been re-launched. During interviews, this Ministry-lead training program was mentioned in conjunction with licensing and the need to have guides certified. According to respondents, licensing would maintain a level of service, allow for training and re-training, while potentially elevating the status of guiding, and drawing more people to the role:

“yeah, they should be licensed cause what it does is you know, it brings up to a certain calibre...to deliver to the clients that's comin in. I mean why should you pay me five to seven hundred dollars a day, and I'm not able to give that angler that service, I'm not qualified for that service. So you payin all this money and you getting twenty percent of what you should be getting.” (Jeffrey Pinder).

“Just like in any other industry, you have to be certified for you doing now.” (Meko Glinton).

“Right now da majority of guides are licensed at least what I know about around dis area. You have to take tree courses, you have to take an Orvis certification course, and you have to take a Bahamian certification course, dis thing they call an STCW course. You have to do an STCW course, which qualifies you to be a licensed bonefish guide. I'm a captain, witout dat you can't really guide.” (Stanley Glinton).

The STCW (Safety Training and Watch Keeping Certification) course mentioned in the preceding response, is a required course for seafaring individuals in the STCW convention of the International Maritime Organization (IMO, 2017). This course includes theory and practical training on survival, safety, social responsibilities and fire fighting. Only one guide interviewed mentioned this course. Another guide mentioned the Bahamas Host training course, a course offered by the Bahamian government to educate individuals entering the tourism trade (Bahamas, 2017c.). This

course is designed to equip Bahamian people in the tourism sector with necessary skills for success in customer service. This guide stated he thought his child would need the course in order to become a guide, he was the only guide mentioning this course:

“Well first she has to do da Bahama Host, she's gotta do dat course. Den like I say, I'm gonna take her myself and train her so dat's going to come like feedin a baby!” (Omeko Glinton).

A related concern was the new requirement that all visiting anglers be licensed. Until January 2017, anglers visiting The Bahamas needed no license to fish. Legislation was established in 2017 requiring anglers both resident and non-resident, who want to fish shallow water flats, to purchase an angling license. Roughly, 50% of the income from these licenses is to be directed to a Conservation Fund for return to the fishery through conservation measures (Bahamas, 2017b). The process for implementation of these regulations has been controversial in the industry, but many guides support the new regulation. As previously stated, these regulations have since been disbanded with a change in administration.

#### **6.1.6 Development Related Threats**

Roughly 13% of guides identified development of resorts and resource extraction enterprises, along with industry competition, as a threat. Also, expanded use of airboats (on Abaco) and jet skis (on Andros), and the opening of the Cuban fishery to American tourists under the Obama Administration were also identified by some guides.

Concerns about development threats are not unique to one island. On Andros the concern centers on the development of large tourism resorts, on Bimini the concern is a mega resort in North Bimini, on Grand Bahama the concern is submarine resource

extraction venture (Aragonite), at the east end of the island, and on Abaco the threat is a deep-water port planned for noted bonefish spawning aggregation sites. Finally, on Exuma the development threat noted pertains to the rapid expansion of waterfront vacation homes. Since these interviews were conducted, the government of The Bahamas approved a new deep-water Carnival cruise ship port on the East End of Grand Bahama Island, potentially posing a threat to the local fishery (Tribune, 2017). Guides are concerned over loss of habitat as well as increased boat traffic and anthropocentric generated pressures in areas of development. These threats are geographical in scope, as stated by some of the guides:

“I tell you what, damaged dese areas around Grand Bahama. Now dese marinas, you know da stuff dat dey got in the bottom, we could of see. In da nineteen fifties you could have gone out and see places on da bottom, I would say about 50ft. of water. Right now you can't see da bottom. From [the mud in] these marinas... it never settles. Dat's what killed da population of a fish out in da deep...(David Pinder r.).

“I worry about these people doing a bunch of builden up on the north end on the Resort World. I worry about that because some of the things they do, I don't see where it would call for it. They got some stakes out in the water right now, I don't know what they intend to do there, and that's up in the sound where we fish. There would be days where that is the only place where we can fish” (Fred Rolle).

Guides also noted increased frequency of jet skis and airboats on the flats, a threat potentially related to development; 7 respondents mentioned this concern. Airboat concerns were identified two times with respondents being from Abaco, while jet ski use was mentioned 5 times by Androsian guides:

“I'm a little worried about resorts tourism, right? Bringin a lot of these jet skis, and seado or whatever runnin over da flats. Dese tings can go real flat [shallow]. I don't have no problem wit the skiing on, if dey are skiing or runnin them out offshore and not on da flats. So dat's my problem you know, oil comin into da creeks, da big boats pumpin out stuff like dat.” [mother ships, discussed in category 9] (Ornold Greene).



“we have jet skis coming on stream now which is really wakin up da flats, it's running da fish off da flats. Dere's a lot of boats going through da channels and da creeks, dere's dredging in new areas...you know what I mean, so stuff like dat is pushin da bonefish further and further off da flats.” (David Russel Jr.).

Additional concerns noted by guides that fit into the development category are, increased competition and the opening of Cuban bonefishing. Three guides indicated there are too many lodges and increased competition because of more lodges is resulting in smaller shares for each. This concern also pertains to foreign ownership of bonefish lodges (see Chapter 4).

“...let me tell you one of the problems I see in the industry. Originally it was designed for Bahamian[s] to own the fishing lodges, and the foreigners to own the larger hotels and they would complement each other. A particular government came in and they opened the door for the foreign lodge owner, and so they came in.... now, for the local guys like myself, the downfall to us is that after the foreign lodge owners come in, what they do, they would form what I call a nucleus, where they would pool a certain amount of money and they would build a lodge. Naturally all of their friends would come to them because they go on vacation and their friends....That's been the downturn in the local guiding industry even though, you offering comparable service. One day a fellow called me and he said, "such and such a place, they are now spending ten million dollars to upgrade their place and buy boats." I said, "well where am I going to find 10 million dollars?" If you could tell me (laughing), where I could find 10 million dollars, I do it tomorrow! But this is what the industry is finding. We cannot borrow no hundred or two hundred and fifty million dollars to build no hotel, we can't afford it. We want to invest in people, we want to invest in the industry and in tourism, so if you could come up with a hundred thousand dollars, if we could borrow 100 or 200 thousand dollars to build a lodge I feel that we deserve to do it. If a fella who can afford to put ten million dollars renovation in a fishing lodge, how can I compete with him? Impossible, ain't no way I could do it. As a matter of fact, if I had ten million dollars, I wouldn't have a fishing lodge, I'd let somebody, I'd give it to my daughter and say, "ok you handle that". So you see, we are between a rock and a hard place. The Ministry of Tourism enjoy seeing this much money come in and being spent here, that much spending, the Minister of Finance, this money spent there. But the fact still remains what they haven't given any consideration to is how does the average fellow make it if these people with all those big bucks come in, how are you going to make it?" (Samuel Raymond Mackie).

Although only expressed by one guide during interviews, this issue is problematic throughout The Bahamas as many existing lodges are foreign owned, and foreigners often have more capital to invest on developments. Of the 19 lodges visited for this research, only seven are Bahamian owned; six of these are on Andros, and one on Abaco.

Although four guides mentioned competition from Cuba, only one expressed concern about the opening of that fishery and the impact it may have on their guiding business:

“Well one situation, I hope it don't get worser, cuz when dey go into Cuba, maybe \$10 or \$20 can go fishin...Bahamas hundreds. Hell, if I can spend less money to go fishin, why not go der? It may cost me but I go der.” (Ralph Moxey).

When this elder guide was asked if other local guides worry about that same thing, he responded stating:

“Dey don't hardly know much about what's goin on now, dey don't know much what's goin on now, dey just take it as it comes. But, dey should, dey need to do. See dey don't know how bad it would be for da Bahamas if da Bonefish industry open in Cuba because dere's more bonefish in Cuba, dan what in da Bahamas. And it's cheaper in Cuba den Bahamas. Vee right now gettin tourists in da Bahamas is because of da treaty wit da different government. Some of da people, say it's a little further to go to Cuba wit deir boats fuel wise, so they make it shorter to come to Bahamas. If it become, dat change around, well hell, fellas may say, “well hell go to Cuba.” (Ralph Moxey).

Other guides were less concerned, explaining that The Bahamas has a competitive advantage due to bountiful fish, beautiful coastlines, etc.:

“The Bahamas is a little small archipelago, dat is rich wit sun, sand, and beautiful waters. Cuba might have a lot to offer, but dere's no comparison wit dem.” (Ebbie David).

“If you Google Earth Andros alone, Andros, forget the rest of the islands. Andros alone has more flats than anywhere else in the world. So am I worried about it [Cuba]? Not at all, I give it a year or two, the fish there going to be so spooky and scared of flats boats that they're going to have to be running elsewhere. The

anglers are going to have to be going elsewhere. It is not a good thing to cram a particular area, Andros has so much diversity and flats and ecosystems, my dad has been fishing here for 45 years and he has not finished one third of it, so every day that I go I know where fish are going to be at, but I don't go crowding those particular spots. Everyday is an exploration because there is new frontier to explore and that is why I am an advocate for Andros Island because I know what is here.” (Shawn Leadon).

The threat significance of competition from Cuba is currently unknown.

Historically American anglers have had very limited access to Cuba under the embargo.

Relaxing of laws under the Obama administration permitted an increase of American travelers including recreational anglers. Recent political shifts in the United States under a new administration indicate a re-tightening of sanctions against Cuba, potentially once again, affecting travelling American anglers. A leading US based flyfishing travel agency explained that saltwater flyfishing travel accounts for 62% of their business, and The Bahamas account for 26% of that total (Davis, 2017). Travel to Andros represents 43% of their Bahamian travel bookings while, Grand Bahama accounts for 25% of bookings, Abaco 18%, and all other Bahamian islands combined, comprise the remaining balance of 14% (Crooked, Acklins, Bimini, Berry’s, Long Island) (Davis 2017). According to Davis (2017) his business has seen a 20% year over year increase in bookings in the past 5 years, but travel to The Bahamas has remained flat in the past 2 years, possibly due to pending fisheries regulations, or the opening of the Cuban market. He also acknowledged that Cuba has been ‘huge’ with many bookings from existing clients, many multiple bookings, and many new client bookings. Davis (2017) expects, “Cuba’s popularity to slow, due to substantially raised rates, ‘greediness’, a few negative reports due to lacking infrastructure, and those who went, can say they have been there and may choose to go elsewhere.” He continued

explaining their business approach to the Cuban fishery. “We only promote Cuba in the late spring and summer for tarpon and permit. 75% of the anglers that inquire about Cuba we end up sending somewhere else, so in fact you could say Cuba is good for other easier, more reasonable destinations that offer similar fishing, like Belize and the Yucatan.” Davis (2017) explained that Cuban trips work through Bonefish and Tarpon Trust who have scientific work permits. As a result the number of permits provided, restricts angler numbers, and any proposed restrictions will have no effect on the model. The impact of the Cuban fishery on Bahamian bonefishing is difficult to assess as the opening of the Cuban fishery coincided with discontent resulting from controversial fisheries regulations. However, it is reasonable to assume a reduction in anglers will impact the Bahamian bonefishing industry. This in conjunction with anthropocentric developments, threaten sustainability.

#### **6.1.7 Poaching**

References to poaching, mostly by Dominican and Cubans, were made by 9% of the guides. One of the guides, who had for decades been a commercial fisherman before turning into a bonefish guide, noted that poaching had also impacted commercial fisheries, and stated:

“The ting about commercial fishin is it's a rat race out there, we've been having a lot of poachers comin in and really taking for my industry, Dominicans especially, so it [commercial fishing] kind of slowed down to a crawl.” (Douglas Saunders).

The significance of the threat of poaching had lessened in recent years, perhaps a result of a ban on shark fishing, as two guides state below:

“Well the Cubans used to come and harvest a lot of our sharks, that stopped. The Cubans used to come and get them by the hundreds. They would anchor up on Fish Cay Bank, catch hundreds and hundreds, but that stopped, so the population has gone crazy.” (Nathanial Adams).

“The Cubans just stopped poaching this far in [to the islands].” (Nathanial Adams).

Some elder guides blamed loss of fishing equipment on a decline in local fish populations and blamed poachers for using pots (fish traps that are baited to attract fish):

“Dose fishermen being wit da pots. When dey put dem down and dey lost one of dem, dat killin fish. Dat kill and kill for years.” (David Pinder Sr.).

“Yes sometime Cubans, I mean I didn't see it dis year but sometime just about probably a hundred would comes over here and dey would do potting. Dey got dese giant fish pot dat dey would bring it up an da line would break. And their pot being down dere, dat would kill tousands a pounds a fish in the water. We also have da Dominicans, but dey come further sout like Great Bahama Bank. ((Simeon Higgs).

Guides explained that use of pots for fishing is no longer permitted but poachers still use them.

### **6.1.8 Netting and Overfishing**

Netting as an industry threat was raised by 8% of the guides. It was noted as a cause of decline in bonefish, tarpon and permit populations (see Chapter 5). Netting in The Bahamas was banned under Regulation 7 (1) (a, b) and 7 (2) (a, b, c) of Chapter 244 of the Subsidiary Legislation of The Bahamas, advise of the laws governing the use of nets in The Bahamas. Additionally, Regulation 48 (1) (a, b, c) of Chapter 244, of the Subsidiary Legislation of The Bahamas, advise as to the gears foreigners are permitted to use in The Bahamas, and Regulation 34 (b) of Chapter 244 of the Subsidiary

Legislation of The Bahamas, which deals directly with netting bonefish. While netting is poaching, poaching as an issue presented in interviews, was tied to Dominican and Cuban fishers. That is addressed separately under the category of poaching. Netting or ‘hauling’ as locals call it, was only associated with local Bahamians, although presumably Cuban and Dominican ‘poachers’ probably also use nets.

Bahamian netting laws were established in 1987 (Bahamas 2017c), and while netting was mentioned by 8% of the guides, only 15% among those individuals identified it as a threat:

“I tink a lot of people are still doing dat. I came across some people out of Marsh Harbor just last year in one of da creeks dat I go in and dey had a net across da creek. Why else are you goin to put it across da creek, where bonefish live? Da billfish people, dey use dem for bait...dey're makin good money out of dat.” (Riccardo Burrows).

Others (8 guides) commented how netting bonefish was historically a widespread problem affecting bonefish population, but that netting has now ceased:

“...you see we had to stop the netting of bonefish because some of these guys, not on this island particularly but, some of the other islands, what you do is you, they would take chicken wire and run it across the creek. Bonefish run up the creek on the tide and as the tide drops, they have to come back out, it's going to be dry up there. As they come out, they got trapped by the wire, and then the guys go pick out whatever they want. If they want them all, they take him all, and they use them for grouper traps and lobster traps, as bait.” (Charles Pflueger, former lodge manager and author).

“My only concern was that, at one period they used to net, but the government ceased that so that you can't. It's against the law to net a bonefish, it also against the law to sell a bonefish, it's against the law to take more than one home if you want to eat one.” (Henry Bain).

“In da seventies in da eighties we began to get a problem. Da fish [bonefish] get on da market, so you had guys coming in wit net an nettin big schools regularly every day of da week. For dat reason we did have a big problem. Dat problem stuck around for a while but we use to interact da problem by confronting da people....have a little talk, try to negotiate wit dem. Tell dem, "look you can't do dat", but it wasn't dat easy. Some of them would pull a Colt, a bat, a club on ya,

right away. At dat time you could haul up an eight pound bonefish and get maybe \$20, so you get a hundred bonefish, you got a really good day.” (Leroy Glington).

Netting occurs throughout The Bahamas and guides from several islands noted the threat. Indiscriminant netting bi-catch was not directly mentioned in interviews, although netting of other species was recognized as still occurring throughout the islands. Some of these netting practices were noted to be having detrimental effects on certain species like barracuda, as one guide stated:

“Dey haulin [Bahamian term for netting] plenty of da cudas now, dat netting da cudas is killin dem. Nettin is killin all da fish in da Bahamas.” (Burnt Ferguson).

One guide in particular showed great concern about local netting, explaining netting is affecting all species in the area he fishes. He explained that he had written to local newspapers about the problem, and he had approached Ministry officials with little response:

“I think it's a lack of interest to do something the right way, it takes a little effort and energy. I can give you a post right now to be the fisheries inspector but in order for you to do what you need to do, it's gonna take a little effort and energy. You gat to be here, you gat to be there, you gat to do this, you gat to stay on people, you gat to teach, you gat to make them understand, and we not getting that. I've offered them to come by my place and I would take them out on the boat, we can go, we can run from boat to boat when the guys are out there to check their boats. If they have something small or illegal, take it from then, teach them, you know educate them a little about it...I mean free of charge, I would use my boat to take the officers or whoever, no one never said anything to me yet, no one came to me. So now I just feel as though they getting paid whether they do their job or not, so maybe you know the interest isn't there.” (Tommy Rolle).

Lack of enforcement by Bahamian fisheries officials was noted by 14% of the guides. The islands of The Bahamas due to geography are difficult to patrol, while enforcement officials lack sufficient resources to adequately complete the task (Benjamin Pratt, Bahamas Minsitry of Tourism):

“it's hard to patrol this big area.” (Nathanial Adams).

“It's hard to protect it. If you have someone from fisheries be out dere, da minute dey movin, someone could be watchin you and do what dey want to do, or go someplace different dat way dey don't get caught, or see dem when dey come into port.” (Joe Bodie).

Widespread poverty throughout The Bahamas, and limited access to food force dependence on marine resources, issues implied in the following statement:

“Dat's da problem, we have no jobs for da people to do, dere's a lot of people out dere fishinen.” (Joe Bodie).

Although net bans were imposed in 1987, lack of enforcement made these regulations “ineffective until the 1990’s” (Dahlgren *et al.* 2008:169). A lack of enforcement was noted as a threat to the industry by 10 guides. Ministry officials had no recollection of any arrests since the laws were established in 1987 (Bahamas 2017c). Roughly, 15% of guides mentioned the possibility of guides acting as government-sanctioned wardens to aid in policing marine resources. Some suggested retired guides act as wardens, others suggested that guide education should include enforcement training. Guide vigilantism in the fight against netting was also mentioned, and some guides appeared proud of this approach, touting its effectiveness:

“ I think there's a law for netting. There's got to be like 700 feet or yards off of the shoreline if you want to net, but most of the people don't follow the law like I said, there's no enforcement, there's nobody's going to be watching them do what they want to do.... but back home what we did, we were the, we made ourselves, we appointed our self Rangers of the Flats, and that's because we know you have a net and so we sneak in. Some guys hide their net in the bushes or keep it in their boat, we'll go on peoples' boats and take the net out and burn it. What are you going to say, "Oh you burned [my net?].. what's the business with the net, like why do you have a net?" So we know the guys that haul fish, we took it upon ourselves to destroy them. Back home, I won't be able to pinpoint the haulers [here], but back home we know them, and we go and destroy their net.” (Travis Sands).



“Well, it's different since da government stop all da net and tings you know? It's way much better. So as long as we keep da guys from da net, from doin nettin, I tink it will even gets better. We had a couple of guys doing it [recently] but den we deal wit dat. Yeah, we confiscate deir boat an deir nets, we just put dem out of business.” (Harlon Sands).

The idea of self-appointed net policing, is not unique to one island. Guides from Andros, Abaco, Grand Bahama and Bimini shared stories of net burning incidents, and forcing people who are netting illegally out of guiding areas. According to respondents, guiding vigilantism along with new laws, have reduced the threat of netting on bonefish. Despite this, overfishing of alternative species (e.g. snapper or barracuda), with the use of nets and handlines, along with lack of enforcement, remain critical concerns. As a result of the continued concern over lack of enforcement, some guides have considered formal warden roles, as the following statements illustrate:

“Yes, I do see a roll but it's difficult to implement to the guides because the world is getting so dangerous...” (Douglas Saunders).

“I told the minister [of fisheries], every guide should be a game warden. I was a game warden just about all of my fishing career. I think if a guide is a game warden, he would show more interest, more interest.” (Nathanial Adams).

“...these guys are killin us, and government is not touchin it. We've been talking about this for ever so really they need to do someting. They need to regulate it and they have stuff on the books, but dey ain't have nobody, that's why I tell him, make da guides wardens.” (Herman Bain).

“let the bonefish guides be the bonefish wardens, because if you have a passion for fishin, you will protect it more. But if you just put somebody who does not have any knowledge of the fishing, they wouldn't be able to protect it, they don't care about it. Somebody who is in that area, let them be the wardens, but you can't pay one set of wardens and not pay the other so they wouldn't have no passion...I'm a warden also.” (Burnt Ferguson).

### 6.1.9 Environmental Decline and Changes

Threats directly related to environmental decline account for 6% of the mentioned threats. Within this category respondents noted concern over pollution (4.7%), garbage on the flats (9.5%), radiation (4.7%), submarine Navy testing (4.7%), habitat loss (23.7%), hurricanes (47.6%) and turtles (4.7%). Concerns about pollution, garbage on the flats, and radiation from Navy testing and submarine Navy basting all originate from elders on Andros implying social networking among guides and age classes. These concerns stem from the AUTECH (Atlantic Test and Evaluation Center) US Navy Base, a Naval facility on Andros, established in 1959 (NAVSEA, 2017).

Concern about habitat loss constituted 23.7% of noted issues within this category. Comments associated with this concern indicate the importance of a healthy habitat to sustain local fisheries, as stated by some guides:

“Habitat is the number one concern for me... thankfully on Abaco we have seen some new parks established. The Marls and Cross Harbor [MPA’s], and we are extremely grateful for that. That [habitat loss], is the greatest danger to fish populations whether they are bonefish, tarpon, or permit and I think more and more of the country has to be designated as no development zones in critical areas... like aggregation habitats. What I know is, we don't know a lot, so until we know a lot, we need to preserve the areas that the bonefish can thrive in.” (Clint Kemp).

“it is all about environment in my opinion, that is the greatest threat. We are going to experience more pressure, there's no question about that, and proper regulations need to be put in place but it is environmental number one.” (Clint Kemp).

Hurricane concerns account for 47.6% of the noted threats in this category. Select guides claim more frequent and intense storms are affecting fish populations. On Abaco, the threat is well defined whereby guides perceive increased frequency of cyclonic activities have adversely affected fish populations; they are killed by storms.

Shallow soft bottom areas typical of the Marls, on the west side of Abaco, are noted as being particularly susceptible. Hurricane Matthew, a category 4 hurricane, impacted North Andros in between summer 2016 field seasons and a follow-up winter 2017 session of interviews. This recent incidence may have impacted how respondents perceived the effects of natural hazards:

“The last hurricane we had was in 1966. I was I was 9 years old and I do remember it pretty well, I think it was equal to Floyd. From 1966 to 1999, 33 years, we had one storm which was not that bad. That is 30 some years, that is the cycle and we are past midway of the hurricane cycle... I do think the Hurricanes will cycle back and when I started to say from 1966 to 1999, those fish all lived and that is when we had so many bonefish. Over the year any where you went, you seen bonefish, you couldn't get away from them and then after Floyd killed about 50%, and then Frances, and Jean knocked it down again. We got a couple storm since then but then they slowly, I think they're slowly coming back now and like I said, this is the first year that I've seen baby fish over the year. Several schools of small juvenile fish.” (Buddy Pinder).

“every time you have a hurricane, an you have a surge, fish gets up in da middle of land. Da surge would move da fish, so for dat reason you lose a lot of fish.” (Leroy Glinton).

“Da change is I ink mostly taking place since we started to have all dese hurricanes. Since we have da hurricanes all of da flats have changed. Where dere was sand and where dere was mangroves some of dose places are gone. Da behaviour of da bonefish, I don't know if we has experienced da same, it is not dat we don't have, we loose a lot of fish too... right after Floyd, we loose a lot of fish cause da fish was all up in da mangroves. Up in da road, dead fish guts. And you will see da same tdings with da birds. We don't have a lot of shore birds. Dey say that it takes 4 years after every hurricane to build up, we had at least 10 major hurricanes in Abaco in da past 12 years, at least 10. So it never really come back to what it was. Like I said, da flats can change and dat can be a big reason for da fish to move to different areas. Dere are some areas you go now where you will find quite a number of fish. It seems like back in da 80's or the 60's you could go to any flat and you would know dat dose fish where for dose flats. Dey may move into someting different, but it seems now dat dere would either be no fish on that flat, or you find many fish. Da hurricane damage dat has affected da population because some places where you have had a lot of good bottom, grassy, it is all gone, but some places you never had beach, you now have a whole beach. Da bonefish dat use to live in dis area and depended on da grass, are gone.” (O'Donald McIntosh).

Guides on Abaco, Grand Bahama, Exuma, and Andros noted the threat of hurricanes. Hurricanes that have affected The Bahamas since 1926 when early bonefishing began in The Bahamas include, the Nassau Hurricane of 1926, the Miami Hurricane in 1926, The Bahamas Hurricane in 1929, The Great Abaco Hurricane in 1932, Hurricane Donna in 1960, Hurricane Betsy in 1965, Hurricane David in 1979, Hurricane Andrew in 1992, Hurricane Floyd in 1999, Hurricane Michelle in 2001, Hurricane Frances in 2004, Hurricane Jeanne in 2004, Hurricane Wilma in 2005, Hurricane Sandy in 2012, and Hurricane Matthew in 2016 (Nassau, 2017). Not all islands in the Bahamian archipelago are affected by each hurricane, but frequency of storms appears to be increasing, which aligns with statements made by the guides. Between 1960 and 1990 there were three hurricanes; between 1990 and 2000 there were two storms, and since 2000, there have been six hurricanes.

As noted by some guides, hurricane impacts have not all been negative. Some guides noted increases in permit populations following storms:

“after a storm, you know a tropical storm or a big hurricane, a lot of permits come, I don't know if dey come from da ocean, or out of da blue holes, but just after a storm... about 2 or 3 days after a storm, when dat mud started move away, da permit be all over da place. I believe dey can find a lot to eat around dat time, an I tink a lot of dem come from out of da deep, and come out of those blue holes along da shoreline for feed purposes, but they'd be all over da place and I mean big ones too man!” (Stanley Glington).

A final threat included in this category relates to sea turtles. Turtles at one time constituted upwards of 90% of the diet of Family Island Bahamians (NOTES, 2016). Heavy pressure on turtle populations led to dramatic declines, resulting in a total extraction ban on all turtle species in 2009 (Godfrey, 2009). Roughly, 70% of guides indicated turtle populations have risen since a ban on turtle harvest. According to

guides, the effects of turtles on bonefishing vary. Most guides indicated that increased numbers of turtles have no effect on bonefishing. However, the 4.7% of guides commenting on turtles as a threat, observed bonefishing to be more challenging because of more turtles. Easily spooked weary turtles in turn startle bonefish, negatively impacting angling opportunities. Another concern noted with high turtle populations was over consumption of grass flats leading to loss of bonefish habitat and associated forage:

“I know this for a fact in some areas around Abaco they have eaten just about all the turtle grass in a bay like this, because there are too many turtles. It's eventually going to affect a lot of fish because a lot of juveniles [bonefish and other species], live in that turtle grass. Turtle grass is a habitat where they grow up. I have tried to get some of the scientists here from Friends, from the Environment to go and look at it and show them exactly what I see. At one point I would see in a day maybe a dozen or 15 turtles. I can show you 5-600 turtles here now in a day. It is just like anything else, if you put too many in one place, it's going to have an affect on it. I don't know what you do, nobody wants to say lets get rid of the turtles because they are cute. But if you put too many there, eventually they are going to have an effect...” (Buddy Pinder).

“It was a quick change after da government had implement dat [ban], it was a quick change. Dey just start meetin and they just came, dey eaten everyting now. Eatin all da conchs, everything. I see now it's a problem wit too many turtles eatin up all da conchs and eatin all da lobsters out of da shoals, da stone crabs, whatever dey can eat, dey just keep eatin.” (Burnt Ferguson).

“Where da turtle live, dey affect da bonefish one ting, da grass. Dey're destroyin da grass, da turtle grass is a shrimp hatchery. It's wery, wery good shrimp hatchery, an da green turtle is destroyin da turtle grass. It's too many, da whole place is becoming white sand. Bonefishin on white sand is da hardest ting in da world to catch you understand?” (Charlie Neymour).

“...there are 20 to 30 turtles on every flat comin up for air, they spook the fish on the flats, so it a very, very, tricky issue.” (David Neymour).

“The Turtles are eating all of the grass that's where the shrimp and crabs live, that's what the mutton snappers eat, and it's white sand all over the flats. I would say about 25 to 30% of the bonefish is gone because they can't find food.” (Maitland Lowe)

Some guides indicated the ban should be lifted.

“I don't remember how much years dat da government closed turtle, but I tink dey need to open it back up, dey become a problem.” (Timothy Smith).

Other comments indicate inter-island variability of turtle populations and their potential threat.

“...back here, like from the marls side, there's hardly no spottin of turtles, I've seen like one or two. But on the ocean side, I see dem everywhere, green turtles are like everywhere, but on da Marls, dere isn't too much spottin of turtles.” (Thomas Albury).

Concerns associated with turtle populations and impacts on bonefishing reiterate the need for ecosystem based managed as opposed to species-specific conservation. A similar conclusion can be drawn when examining guide responses to shark populations who unanimously claim shark populations are either very high or are experiencing high growth rates.

#### **6.1.10 Governmental Inaction**

Governmental inaction and fisheries regulations were noted in 6% of responses. Guides perceived the government did not recognize the magnitude of bonefishing and the importance of the fishery to Family Islands, as well as the impacts of newly imposed flats fishing regulations:

“I am concerned that our government [needs to] take dis industry a little more seriously. I am concerned that the lodges and the guides get together and sit down and determine their important parts and how we can better work together. You might be aware of current legislation that's they're working on, it's important that we put that together so it's a premier documents for even some of the other destinations to follow, and I think it will be.” (Cheryl Bastian, lodge owner).

“I don't think the government has a clue what the value of this resource really is, and that is evident in the first six years that we were in business, there was no

representation at any of the fly fishing shows, there was not one article, there was not one advertisement, none. No advertisement for The Bahamas government in saltwater fly-fishing magazines for 5 years, so I think we slipped off the international stage in terms of being a presence. In some ways they're trying to do that, to get better press, we've gone through a really rough time last year, with a serious black eye on our product and on our country. We've got some recovery to do and it was not the best time to try that [implementing regulations]. I think that there was a very thoughtless and unwise proposal put forward that gave all the appearances of a country that wanted to make a difficult, it became very antagonizing to the very clientele that make this industry what it is today. No, we didn't have any direct backlash for many of our customers but we had a plethora of phone calls, emails. "What the hell, is it okay?" I think the good thing that happened was they now understand how important this resource is and it was a political nightmare for them. I think it was absolutely one of the most disastrous public relations decisions that we have made to put out an unedited document of new proposals that made it seem like we just didn't want the foreign investor to come, that we wanted to make it difficult, to cost more. We should be as a country, welcoming and inviting, but the industry does need regulation. We should have a fishing license, we should have some other things. We were way behind on that one, but the fact that we wanted to make the foreign angler feel unwelcome, that was terrible." (Clint Kemp).

#### **6.1.11 Walk and Wade Anglers**

Roughly, 20% of the respondents mention walk and wade fishers (or commonly referred to as the do it yourself DIY), as impacting their guiding and fishery. Both forms of fishing were banned in early drafts of Bahamian flats fishing regulations, resulting in discontent in the industry and considerable social media negativity towards The Bahamas. Flats fishing regulations implemented in 2017 omit mention of DIY or walk and wade anglers, and responding guides have mixed feeling about DIY:

"Walking and wading really only hurts about 2 or 3 flats but there's a lot of people rentin houses and boats, and that's pushing...they're goin out to the heart of the flats where I'm guidin. I don't know what will be done about it but I wish there was a way you could sort it out somehow, and be good to everybody because I know that is a big area." (Donnie Lowe).

"Another ting is that da DIY, da indiscriminate DIY...unfortunately not everybody know how to handle the fish, and so you take a fellow out and let him

go on his own and he catch a fish and naturally he releases him. [But], if you don't handle dat fish properly, it's better if you don't even touch him, but if you don't handle dat fish properly, dat fish goes in da shallow water and da tide leave him there and he die. We've got to find a way to not stop, but control da DIY. You can't just have people come, you know they're so happy to see the bonefish they caught, and their friend is about 2 miles away...dey carry da big bone to that friend to get a photograph. By da time he put that fish back in da water, the fish ready to go, you know he die. We've got to have some control of the DIYs.” (Samual Raymond Mackie).

Conversely, other guides were less concerned about DIY or walk and wade anglers suggesting regional variability of the threat. An argument made against a full ban on DIY or walk and wade fishing, was that some islands (e.g. Long Island) rely heavily on this form of fishing, so islands specific regulations may be required (Benjamin Pratt, Bahamas Ministry of Tourism), as stated below:

“I wouldn't say it's a major issue wit my area but you know, some of da guys say dat's an issue. You got to be able to work and move around, to find new areas and fish. Dat wouldn't be a major issue if you're actually workin an movin around, so you know it wouldn't be pressure.” (Drex Rolle).

#### **6.1.12 Technology**

Only 3% of the guides made references to threats due to technology. One of the guides mentioned hand-held GPS as a threat to guides and therefore the industry:

“I’ve run into a lot, I’ve run into a lot of people like dat. Dey’ll come and say I need a bonefish guide for a day....I like you to take me bonefishing. What dat is tellin me is dat you just want me to show you da area where to fish and once dat happens, you don’t need me anymore, because a lot of dem dat comes to you, dey have a GPS so whatever spot you go into, dey are marking it with a GPS. So dey can go back to it and do da fishin demselves.” (Carl Rolle).

A second and related issue, is the problem of mother ships, noted by some guides, Mother ships are large foreign owned private yachts that import bonefishing boats and guides into The Bahamas. These ships historically employed foreign guides, but are increasingly hiring local Bahamian guides. They are still viewed as a threat by



many guides, and the threat appears localized to Abaco, Andros and Grand Bahama, as guides from these islands stated:

“Another problem we have is a lot of mother ships come over from da States, and fish in our waters. Dey bring their guides, they come once trout and bass season close der, so dey come over here in da bonefish season and fish the waters, and den go back. They bring their own guides, everything including cooks. I worked off a boat before, it was a hundred and someting feet long. Dey hired Bahamian guides, which I don't consider a problem, but when they bring their own guides.... A lot of these guides are smart. They'll come and fish wit you wit GPS in their pocket. Dat's why I tell people no GPS allowed in my boat!” (Stanley Glington).

“Another thing, again not to say casting aspersions on you, or Americans but they have mother ships. The mother ship, if some rule or regulation is not placed on it, the industry will die because for instance, like I said, we don't see much of it here but up south, and even north, and most of the other islands, the mother ship would come over and bring 6 or 8 dinghys and they would take over the flat, as they carry their guests. Dey bringin their own guide[s], which is illegal, against the law, because you cannot be gainfully employed here, without a permit. They will come and bring their guests and their gas. It's not fair and that's one of the reasons why you find we're trying to get, what we call, legislation in place now to govern it.” (Douglas Saunders)

The Bahamian government in 2017 enacted the legislation, mentioned in the second quote above.

### **6.1.13 Consultation**

Inclusion of local people in decision-making is important for sustainable outcomes. However, only one interviewee mentioned lack of consultation as a concern. The individual making this statement is the President of the Bahamian Guiding Association, and is influential among the guides. He is a polarizing individual and was pivotal in the implementation of bonefishing regulations (considered contentious by many), which have since been terminated. While he is influential, and the only guide to explicitly raise this concern, it is probable that other guides have the same concern, or

will have, in the future. Alternatively, guides interviewed for this research, may have felt that through this study, because they were being questioned, the need to mention a lack of consultation was pointless, as one guide stated:

“I know if the local people are not empowered through the process, you cannot truly protect the resource, because that means you are subject to whatever the global decision-makers decide they want to do to The Bahamas today or tomorrow. Often times, let's say a big corporation in China, or in Japan, or England, they can make a decision that I want to do certain kinds of development without the local knowledge of how that will impact the country over all.” (Prescott Smith).

With 178 identified threats, only 2 interviewees, indicated they had no concerns about the future of the fishery. The first of these individuals believes there are two separate forms of bonefish, “season fish” and “school fish”, the former replenishing the latter. Season fish according to him reside in deep water, and seasonally come to the shallows to spawn, replacing local populations, therefore he assumes populations will remain healthy indefinitely. He did not raise other concerns. He is clearly religious and although his response did not explicitly state that God would take care of the fishery, it was implied through his tone, the interview, and his vocation. He is the local pastor.

“No, I don't have no worries, da fish what we fish at, is not da school fish. Da fish dat we fish at is da season fish. Dey come in and dey drop their own...” (Charlie Smith).

The second of these individuals, although not a local pastor, explicitly referred to spiritual belief that humans could not harm “God’s” creations, without God’s permission.

“You can't do no good. Let me tell you.... anyting what God made, an have hand on, it's not like you buildin a car. One bonefish, you don't know how many bonefish dat one bonefish hatch, an what you tink about a heard of bonefish got over 300? Dis da way I look at it, you can't kill out da bonefish. You could spook dem, an run dem round, but you can't do notin to kill out fish. Da

breeden is so much, an dey out of your way. Fish breedin is not in a man way because you don't know whedder a school of bonefish out dere now dropping deir eggs, right on dat flat. Next couple of days, you don't see dat gang of fish till about 15 days. What scientists say before you see a fish come to maturity, you could see him, an I don't know how long it take him to grow but, so for dat reason, man cannot kill out fish. To my knowledge about da Bible an understandin, man only could kill out what God let dem kill out. Right in our water dere, you don't know how much tousands or billions of young fish in dat area right dere. So now if you put someting in da water dere to poison dat water, to do someting like dat, when you tink you poisonen da fish, you poisonen yourself.” (Eddie Bannister).

Though this elder identified the fact that ‘poisonen’ in the water could harm fish and humans, he did not overtly state the concern, or that any ‘poisonen’ had occurred in the waters that he guides and fishes. Despite these two individuals, overwhelmingly guides feel threats are impacting the tourism sector. Moreover, a noted combination of threats, significantly challenges management and long-term sustainability.

## **6.2 The Potential Role of Guides in Bahamian Resource Management**

Assessing how guides can potentially inform sustainable resource management policies in The Bahamas is challenging. Many of the noted concerns and respondents’ quotes illustrate considerable local knowledge of the bonefishing industry and local ecological processes beyond bonefishing. Interviews demonstrate passion for the fishery, and recognition of its importance at micro and macro levels. Considering these points, guide awareness of changes in the recreational angling industry appears extensive. Due to local knowledge, geographical proximity, and dependence on these resources, it is logical that guides be involved in managing these resources.

Conversely, guide understandings of certain local processes appear diverse, and in certain cases, inconsistent. Examining bonefish spawning habits as explained by

guides, illustrates this issue. A total of 17 guides (24%) raised the issue of bonefish spawning. According to some guides, bonefish spawning takes place in shallow creeks and along mangrove edges

“Anywhere dere’s a creek, where dey can get in. Cuz dat’s where dey drop deir young ones, anywhere dere’s a creek. Dey come in da creek, dey go on da flats, and dey be dere till time to drop deir young ones. Dey drop deir young ones, den dey go back.” (Stanley Forbes).

“I believe that they spawn in the marsh you know in the mangroves? I think they go in there to lay their eggs.” (Rudolph ‘Timer’ Coakley).

“Bonefish spawn in muddy water, dey don’t spawn in da grass because, dey afraid dat da eggs will goin to get disappear. Now what dey does, dey go to da mud and she swims around with deir mouth open, and he screet da milk. Anyone ever show you a bonefish milk on the flat? Dey say it mud, but dey not sure what it is. I sure, cuz I run a test on it, all don’t be mud, some of it be da milk from da male fish. She swims around wit her mouth open, dat’s what my camera got, her mouth wide open, 198housand around, sucking in da milk to hatch da egg. After when she feel, like it’s time to lay, she gets to the mangrove roots. Any place there’s mangrove roots in da creeks and all dat, when she gets to da root...I ain’t telling you what someone tell me, I’m telling you what see for myself. Dis is what she does, she’ll [swim] along da mangrove roots, wit her head up... I see her shake and once in awhile, getting da rest of da young ones out. What we did, we didn’t go too far away, and we saw her cool right down, we went over towards her and we throw a fly, and she took it. You know when we caught her, she was still bleedin from da naval string. Den we eased her back in the water. Dat’s how I got all da proof.” (Charlie Smith).

Still others explained bonefish spawning takes place in deep water and some guides noted observing large schools in deep water:

“I’ve seen them in the ocean. I’ve seen them out in like 800 feet, schooling in the ocean.” (Rudolph ‘Timer’ Coakley). [This was attributed to fish seeking warm water in the ocean in January.]

“I have seen bonefish in a 2 to 4 tousand feet of water, dat’s right out in da front of here.” (Nelson Leadon).

“ I went out for red snapper in about twelve hundred feet of water for red snapper, and I saw this thing looking like a shade coming, moving around and around, coming from all the way down at the bottom. When they got about to a

hundred feet down, I could see that they were individual fish. Amazingly enough, they were bonefish in 1200 feet of water.” (Samuel Raymond Mackie)

Disproportionate time spent in shallow water pursuing bonefish may skew the number of deep-water bonefish observations. Guides identifying deep-water bonefish aggregations appear to have observed these by chance, while either big game off shore fishing, or reef fishing. Also, disbelief in current biophysical understanding of bonefish, acquired through a scientific process, was also apparent in guide responses:

“Well you would find when the school’s settle in the back here, there’s a lot of Turtle Grass there, the experts say they lay their eggs in the ocean and all this kind of thing, but when you get around here and you meet the school, you could see the males shooting off the spawn, the sperm. You can just see the males releasing.” (Samuel Raymond Mackie).

“...well you know, we have Bonefish and Tarpon Trust come up and they study the bonefishes, and they telling us that they should spawn in the ocean. I said why should these fish go in the ocean, make a baby, and let the baby in the ocean? Bonefish is so scared of predator, you know what I mean? They like the mangrove they like the protection.” (Stevie Ferguson).

Spawning season discrepancies also raise issues concerning the accuracy of guide understandings. Some guides note spawning occurring all year with more pronounced spawning periods, while others consider April, May, and June, or October and November as spawning months. These discrepancies in local knowledge are evident in the following responses:

“I know that they spawn almost year round, I’ve caught bonefish with rows in dem every month a da year. It seems to me that they row more in May and November and one thing about a fish. A fishes spawn, it ain’t like a woman, fish could spawn till they die...” (Ansil Saunders).

“Mostly in June and July and August, sometimes in September. Every moon they spawn up.” (Maitland Lowe).

“You see the bones spawn between October and February. Now you may find a rare occasion where you find them in August with spawn but the

general spawning is between October and February. Sometimes [in August], they so loaded that it spills out.” (Samuel Raymond Mackie).

“This coast they spawn about May and June. On Cherry Cay side, it be May and June. Every bonefish we made in May and June is full of ruined milt, we call it milk, the yellow in the white and if you get them in November you want to keep on lookin. Then you kill [a fish] in June and Jul, you barely see ruined milt but you killed them in November and December everyone out of the milt. That's what I don't know, what's the difference...November, December couple of miles here big body of channel water. Maybe the reason why May and June on the ocean side, 6-8 months difference in this morning. I don't know, we have ocean water, 400 square miles and nearly nothing more than twelve feet of water.” (Donnie Lowe).

“The mating is, like I would say, between the full moon, the first of April and the second week of May.” (O'Donald McIntosh).

When guides were asked how they know bonefish are spawning, responses varied. Most consider shallow water aggregations with surface swimming as spawning behaviours. Consider the following excerpt of an interview with a guide:

Interviewer: When do bonefish spawn?

“Dey're going to spawn, next month (April). Dey have changed, it used to be dat dey would spawn in March but in more recent years I started to see dem spawnin later.” (Garth Thompson).

Interviewer: How do you know they are spawning?

“Because dey're all floatin on top of da water, thousands. All over on da flats everywhere dey're floatin.

Similarly, some guides also consider surface gulping as a spawning behaviour.

Guides refer to surface gulping as “bibbling”, because of sounds made by the fish, as stated in the following quotes:

“Dat's when dey bibbling. Oh I see dem by da tousands. I know exactly where every school does be doin dat. Right in front of Charlie Haven dere, and down on da end toward da Hurricane Hole, up around by Tranquility Hill, in da creek dere called Hager Creek, which is a deep channel but dere's some flat in dere. Dey does dat dere too, den one of da main area, it's Chalk Sound, an between

Bigwood Cay, Bang Bang Club, and Charlie's Haven. Dere's a blue hole, 225 deep...an da bonefish be dere by da tousand.” (Charlie Smith).

“you hear dem bibblin like dat, you can hear da mouths snappin.” (Charlie Smith).

Explanations as to what bonefish are doing when “bibbling” vary. Some perceive the activity as a part of spawning, others attribute it to freshwater intake, still others explain it as feeding on worms or small jellyfish:

“Well when dey're doing dat, dey're surfinen for...dey intends to be, rowin times - baby. Dat is from April up to June, an a little beyond it, a little before April, but April happen to be DA peak what in dat bibblin terms.” (Nelson Leadon).

“...dere's a certain time when da bonefish come when dey schoolin in da winter, when da water gets cold. Dey come in and dey come right up on da water. Da country was dry, we didn't have no rain, dey come up and drink. Fish gotta drink freshwater, although dey stay in da sea, dey drink freshwater...” (Jeffrey Ferguson).

“...between October and February. They would stay just below the surface and if you see the wind is going to change direction, for instance if they are there this evening, they will know when the wind is going to change....you find they start porpoising. Now a lot of time, when for instance this is now June, but like in April and May, there's something we called the 'bibble'. The bibble is when in the North Bight, starting from right here actually in the North Bight, groups from 300 to 3000 fish gather together. The smaller fish stay on the surface clipping the water, and the bigger fish stay on the bottom and they dig. What they are doing, that is a time when the sea worm hatch[es], and they feed mainly on the sea worm.” (Samuel Raymond Mackie).

“You got some guys dat will tell you, when da bonefish up in da water, snipping da timbles, dey tell you, say, "da bonefish spawnin"... dat ain't true. Der's a bunch of timbles [thimbles] come out in May and June, in da water. See, da bonefish know dat and dey'll school up, an get together an start [gesturing to eat with his lips while making a smacking sound]. You hear dem bibblin like dat. Dey family to da jellyfish but they timble because, dey look like a timble [thimble]... what da modda put on da finger when she's sewin... yes.” (Charlie Smith).

Inter-island variability in ecological processes or regional cultural variations may explain perceived discrepancies. Either way, understandings of observed processes differ among guides. Already challenging aspects of resource management may be further complicated by misinterpretation, or misunderstandings of local processes.



## **7. Summary of Results and Discussion**

This chapter provides a summary discussion of key results presented in chapters 4, 5 and 6, beginning with discussion of economic and social implications of Bahamian bonefishing, followed by consideration of potential environmental implications. This chapter ends with some key observations on how guides' perspectives on contemporary changes in the recreational angling industry inform sustainable resource management policies in the Bahamas.

### **7.1 Economic and Socio-Cultural Implications**

Studies by Fedler (2010 and 2018) as well as Southwick et al., (2016) clearly illustrate the economic significance of recreational angling to The Bahamas. From a guide's stand point, unanimous consent among respondents that bonefish guiding is a good job, and good for young Bahamians, suggests positive economic benefits and possible sustainability if tourism demand remains constant. These results may be biased toward a livelihood that is supporting the guides, however, unanimous agreement among the non-guides interviewed also confirms the economic importance of bonefishing to the Bahamas.

Longevity in the profession may suggest self-satisfaction with the role as a guide. With an average number of years guiding at 29.8 years, guides appear satisfied with their employment, potentially a result of high pay and job gratification. It is worthwhile noting that many guides indicated that they were either fully employed independent guides, or that they worked full time for established lodges. Others noted that they are both a guide and a lodge owner. Many guides indicated that more guides

are needed to meet the demand, and that they work as much as they want, while Bahamian overall unemployment rates were 12.7% in 2016, with an average of 10.8% from 1998 to 2016. (Tradeeconomics, 2018). A record high unemployment rate of 15.7% occurred in 2014 (Tradeeconomics, 2018), yet according to guides there is a deficiency in the number of guides available, versus the number needed, suggesting very low or no unemployment in this fishery. Several guides commented on the high pay garnered through guiding, while others stated guiding had afforded them education through contact with elite clients, and financial means to establish businesses. Some interviewees explained they were able to buy a boat to start their own guiding business, open a restaurant, or develop a car rental agency, all a result of guiding for bonefish. The average Bahamian annual salary for residents of Nassau is \$33 548, and a gross national income per capita of \$21 280 (Payscale, 2018), or about \$425 per week. Guides generate upwards of \$400 daily (Davis, 2017), making them highly paid workers in The Bahamas. On Family Islands where employment opportunities are scarce and employment quality low, guides may be among the highest paid residents; potentially creating financial divides between those in the industry, and those not associated with bonefishing.

Although these results indicate potential sustainability of bonefishing, they are reliant on several assumptions, namely that tourism demand will remain constant, an unknown variable affected by global economics, health of The Bahamian fishery, tourist preference, and many other factors. If anglers are unable to access guides because of a deficiency in guide quality, or a lack of guides, issues noted throughout interviews, then tourism demand may change as anglers seek other markets. While

guide longevity at an average of 29.8 years suggests gratification, it is problematic for the future of the fishery in the face of few young guides entering the profession, an issue also noted by guides. Disinterested youth do not appear to be an issue driven by a tourism irridex (Doxey, 1975). Guides commonly explained there is a stigma facing employment in The Bahamas that requires physical labour, as opposed to prestigious white-collar positions like doctors and lawyers. Avoidance of employment based on physical labour may be an indication of black servitude theory, a function of traditional colonial governance, and white supremacy, when slavery-based agriculture perpetuated throughout the islands (Thompson, 2016; Craton, 1986; Craton and Saunders, 1999, 2000). Overcoming this social issue will be challenging. Demand for and interest in, information technology may also impede outdoor pursuits in youth, and guides too mentioned this issue.

Roughly, 61% of respondents identified a family member as the impetus to begin guiding. Guiding in The Bahamas has seemingly become a family tradition and family names like Pinder or Folley on Grand Bahama, Saunders on Bimini, Smith, Moxie, Leadon, Coakley, Bain or Neymour on Andros, and Rolle or Dames on Exuma have become synonymous with a guiding tradition. It is possible that guiding families have monopolized local guiding, by specifically supporting family members, recognizing the economic importance of guiding to their families. Learning from a family member suggests familial social networking and trade-based education. When asked about necessary skills to be a good guide, 73.7% of responses referred to communication, networking and interpersonal skills. These highly transferable attributes, and regular contact with elite clientele, may improve overall education levels

and reduce negative social issues common in less developed, educated populations. A benefit to local populations is foundational for sustainable tourism, yet the extent of benefit beyond guides is not ascertainable from solely focusing on guides. Silvy et al. (2018) studying local resident perceptions of Androsians towards conservation and illegal harvest, provide valuable insights that extend beyond guide interviews conducted for this dissertation. Their study revealed social, economic and environmental issues that may affect bonefishing sustainability.

The government of The Bahamas, developed, implemented, and then later rescinded fisheries regulations for Bahamian bonefishing. Changes to the Bahamian administration with an election in 2018 resulted in removal of controversial angler licensing legislation. These regulations were intended to enhance fisheries conservation measures, while protecting the guiding livelihood. Still intact fisheries regulations have special protections on sportfish including bonefish (Department of Fisheries, 2003). According to Silvy et al. (2018:340) their informants regarded marine species labeled as sportfish by the government (Department of Fisheries, 2003), including bonefish (*Albula vulpes*), as food sources, and consequently were “unhappy about perceived control over harvest regulations by social elites”. Broad and Sanchirico (2008) also noted that residents relying on artisanal or commercial fishing had lower support for marine protected areas (MPA’s), while Bahamians relying on tourism had greater support for MPA’s. Hayes et al. (2015) concur stating that animosity towards bonefishing, illustrated in Silvy et al. (2018), threatens sustainability of the fishery since local populations are not all benefitting from the resource and are actually being excluded as a result of ‘social elites’. While respondents interviewed by Hayes et al.

(2015) on Andros overwhelmingly recognize the benefit of tourism to their quality of life, they also widely acknowledged the negative impact on local resources with examples that included limits to access for locals, over extraction, and additional garbage or pollution. Further, as noted by Silvy et al. (2018:340), fisheries regulations for sea turtles, queen conch, and Nassau Grouper were established without “clear evidence of influence from Androsian residents. Rather, these regulations were instituted by educationally and economically privileged people largely from other islands and countries operating under a benevolent, though paternalistic, model of using evidence-based decisions to protect resources for the future.” According to respondents queried by Silvy et al. (2018:341), “informants generally felt uninvolved in, and about these processes... consequently many informants felt no compulsion to follow regulations after their establishment, feeling they should be exempt from the regulations due to their long-standing use of marine resources.” It is plausible that some Bahamians feel a similar decision-making structure was used to develop regulations for bonefish throughout The Bahamas, hence locals may feel privileged to use bonefish resources as they see fit regardless of regulations. This would add more stress to the fishery but confirming this is challenging because people are not generally open to stating they disregard laws.

The Bahamas National Trust (BNT), a governmental agency, is involved with the establishment of fisheries regulations and marine protected areas in The Bahamas. Because the BNT is a remnant of a colonial era, as some expressed during fieldwork periods, their actions and decisions are not always well regarded throughout the islands. Political ecology in this tourism arena challenges long-term sustainability because of

socio-cultural and economic incongruences between guides and non-guides (Karrow and Thompson, 2016. See Appendix E). Resident perceptions noted in Silvy et al. (2018) shed light on how non-industry linked individuals on Andros negatively regard bonefishing. It is conceivable that such sentiments exist on other Bahamian islands given similar socio-economic circumstances dividing guides from other Bahamians, with governmental regulatory supports potentially excluding local residents from local resources. While demand for guides appears high, and according to guides, few youth enter the profession, Silvy et al. (2018:347) conclude that (bonefish) guiding “remains largely out of reach for most local residents.... Few local residents serve as full-time guides precisely because most residents possess subsistence-based livelihood skills, but not the resources required of an eco-rational entrepreneur, such as social networks containing wealthy tourists.” This may account for the predominance of guiding ‘families’ where active guides appear to frequently have learned the necessary skills to be an effective guide from family members. Transfer of knowledge from generation to generation is a cornerstone of local ecological knowledge (Berkes, 2012). These transfers provide lengthy temporal ecological observations that are vital for effective resource management.

Silvy et al.’s (2018:347) conclusions also suggest guide training is needed in order to shift from traditional subsistence-based livelihood skills, to service related skills noted by many guides (inter-personal skills like communication and networking). Interestingly, the Ministry of Tourism cancelled the (bonefish) guide-training program. This may reinforce the monopolized family guiding tradition that exists in The

Bahamas, perpetuating guiding families, while potentially reducing the number of recruits entering the profession.

Results of this study generally suggest a sustainable tourism practice from an economic and social context from the point of view of the guides. However, if locals disregard regulations designed to protect bonefishing, illegal harvest will exist, and if locals regard guides as social elites, hostility may ensue. Moreover, it is probable that if non-regulated fish stocks dwindle (like Snapper (*sp.*) due to over extraction), then better protected sportfish populations may face increasing pressure from local impoverished subsistence anglers, thus negatively impacting health of the bonefishing fishery. Guides from the West End of Grand Bahama Island made note of this very problem predicting greater extraction of bonefish as a food source as ‘traditional’ species decline, a result of ineffective management, over extraction, and illegal harvest (out of season, under size etc.). It is reasonable to conclude that this issue was noted on Grand Bahama and not on other study islands because of a larger human population who have placed greater pressures on local resources. With time and population growth, other Bahamian islands may face similar threats on their sportfish populations. On the contrary, Hayes et al. (2015) suggest that ecotourism development in The Bahamas (specifically on Andros) may reduce economic hardships faced by Bahamians, which in turn may reduce illegal harvests. Indeed ecotourism is frequently touted as a tool to empower local communities, reduce poverty and therefore illegal activity (Scheyvens, 1999). However, if all locals benefit from ecotourism and illegal harvest declines, dependence on imports may increase because local subsistence angling has declined, thereby countering ST and ecotourism fundamentals.

A final and related matter to consider is that of enforcement. Guides recognized widespread lack of enforcement. They cited examples of guides' self-regulating local fisheries, potentially exacerbating social and economic divides, and in turn forcing more illegal harvest. Financial constraints, lack of resources, geography and poverty, all challenge The Bahamian government when addressing enforcement of fisheries regulations. Both Hayes et al. (2015) and Silvy et al. (2018), in their examinations of Androsian individuals, made note of insufficient enforcement, noting the 'paper park' phenomena that may develop as a result of insufficient local support and legal enforcement. Similar enforcement issues plague other tourism operations reliant on wildlife. Notable examples include African safari ventures where mega fauna viewing ecotourism experiences struggle with management and enforcement of vast geographical areas, and the high demand for illegal trade items (Mossaz et al., 2015).

As previously noted, from a guide's perspective bonefishing appears to be largely sustainable from a social and economic standpoint. However in this vein, according to one elder guide, the industry as it stands, is balancing on the point of overuse and saturation, with too many lodges and guides in his immediate area. Saturation would no doubt over-stress local ecosystems regardless of the baseline health of any given fishery. When other younger guides were queried on a similar course, responses supported more growth, more guides, and more lodges, most placing a caveat on the number of guides available, the need for more guides, and guide training. This viewpoint may be short sighted, a result of less life experience and observed changes. Greater temporal exposure to a local ecosystem may afford elders a broader perspective on which to draw conclusions, in effect resulting in a shifting



baseline whereby over time knowledge is lost resulting in altered perceptions about previous reference points/baselines. These may have represented changed states from previous periods in any given system (Pauly, 1995). It is possible that economic and social shifts have also occurred, and are only apparent through interviews with elders. One of the elders made note of significant developments related to bonefishing, which have negatively affected his long-time lodging business, thus potentially illustrating a saturation point where tourist demand cannot satisfy supply of accommodations and guides. The Ministry of Tourism perspective on this matter is also potentially troubling as interviews suggest a vision for growth across The Bahamas when it comes to “sustainable tourism” with the inclusion of bonefishing as a form of sustainable tourism. It was noted by the Ministry of Tourism that inter-island variability could limit growth in bonefishing on some islands due to limited habitats, habitat loss, or human developments. Perhaps most import in this is that the Bahamian Ministry of Tourism considers bonefishing a form of sustainable tourism. The degree of sustainability of bonefishing in The Bahamas when considering the impact of the fishery beyond guides is questionable. Related studies are sparse but results from Silvy et al. (2018), put sustainability of the fishery from an economic and social perspective in jeopardy when individuals outside the fishery are considered. The level of this divide may be affected by inter-island variability, yet studies of this sort beyond Andros are non-existent. Fedler (2010 and 2018) refers to employment tied to bonefishing, noting that on Andros, upwards of 80% of the population is directly or indirectly tied to the fishery. If results of Silvy et al (2018) are considered with this in mind, then similar studies on

other Bahamian islands may reveal even more troubling outcomes further questioning industry sustainability.

The paradox of growth versus sustainability, a common challenge facing sustainable tourism destinations, including ecotourism ventures, is challenging. Shifting zeitgeists, greater environmental consciousness with desirable actions like being good stewards, increase tourists to destinations where traditionally, tourist numbers were low. These social and cultural changes lead to more significant tourism impacts potentially countering the benefits of ecotourism ideals. In the case of bonefishing, increased angler demand may ultimately lead to collapse of local island recreational fisheries if excessive pressures are placed on any given area.

The question of whether bonefishing in The Bahamas is truly sustainable from an economic or social perspective is not clear from interviews with guides alone. Further examination of the fishery from results presented by Silvy et al. (2018), Hayes et al. (2015), and elsewhere, suggest unsustainable practices, warranting further examination from a wider perspective for a better assessment of bonefishing in The Bahamas.

## **7.2 Environmental Implications**

Environmental impacts as noted by guides, seriously jeopardize the potential for tourism sustainability. Anecdotal qualitative responses suggest significant changes and decreases in bonefish populations, most attributable to environmental impacts. Guides provided a lengthy list of variables that are impacting bonefish, some of which appear island-specific. Sustainability of bonefishing tourism in The Bahamas is only possible

with a resilient fish population. The long-term viability of bonefish stocks appears in jeopardy, as 47.5% of guides perceived declining bonefish. There could be several reasons for perceived declines including population shifts resulting from increased angling pressure at certain locations, intensified boat traffic, or changes in environmental conditions. The vast majority of elder guides reported reductions in bonefish stocks; some so pessimistic about current bonefish numbers they no longer want to guide for fear that they will have unhappy clients. This of course may reduce time on the water and associated bonefish sightings, making their perceived reduction in bonefish more significant.

The number of guides recognizing a decline in bonefish varies from island to island, with as many as 70% on Grand Bahama identifying reductions in bonefish. Similarly, 53.8% of Abaco guides and 46.6% Androsian guides noted declining bonefish populations. Results from Bimini and Exuma appear less dire.

Perceived bonefish population increases were noted by only 20% of guides while the remaining 32.2% recognized no change in numbers. It should be noted that in some cases, guides perceived declines in bonefish stocks but they had seen recent rebounding of populations. These changes may be a result of bonefish netting bans, fisheries regulations, guides acting to police the resource, or other unknown variables.

Although bonefish are the primary target species for anglers in The Bahamas (Davis, 2017), anglers seeking a “grand slam”, a successful catch and release of three species in one day, also target permit and tarpon. Only 13.7% of guides identified a decline in permit stocks while 62.4% sensed no change, and 23.9% observed increases. This trend was most pronounced on Grand Bahama, where 46.2% of guides noted

increased permit sightings. While some guides on other study islands suggested increased permit sightings were a result of more focus on the species, (hence different angling grounds are being used in response to angler-driven demand), guides on Grand Bahama unanimously agreed that permit sightings in their traditional bonefishing grounds are on the rise. They hypothesized that changing environmental conditions, more favorable for permit, may be the cause, hence although bonefish numbers are down, permit numbers are increasing which may add to sustainability of Bahamian flats fishing on Grand Bahama if perceived trends continue. This potential shift in angling target species availability does not appear in other islands, although guides recognize a shift in angler demand toward more permit fishing. This trend likely explains why 38.5% guides on Abaco perceive an increase in permit; they are fishing for them more, fishing water that is better permit habitat, and their responses corroborate this.

Similar to permit, most guides (61.1%) perceive no change in tarpon stocks, while only 20.4% identified a decline. Noteworthy again are results from Grand Bahama where 40% of respondents indicate increased numbers of tarpon. Responses may suggest shifting environmental conditions are the cause, as well as greater access to deep water, desirable for larger fish species such as tarpon. The Grand Lucayan waterway, a canal that truncates the island through Freeport, provides deep-water access subdivisions where tarpon apparently reside. Thus while development may impair important juvenile bonefish habitats like mangroves and natural shorelines, anthropocentric growth may result in more widespread adult tarpon habitat, ultimately however, this is an unsustainable trend if annual rejuvenation is marred.

### **7.3 Perceived threats facing the fishery**

In addition to fisheries stock assessments, guides were queried on perceived threats facing the fishery. Guides identified 173 threats, which were classified into nine groups. Responses included factors that threaten fishery sustainability from social or economic perspectives (e.g., guide attrition, or lack of guide training), but most responses can be considered environmental variables that impact the fishery (e.g., poaching, over fishing, poor handling, habitat losses, development, environmental changes or increased predation). While there were common trends (e.g., increased angling pressure) across The Bahamas, some inter-island variability was observed. On Grand Bahama for example, aggregate extraction of aragonite and anthropocentric development impacting key bonefish grounds were widely noted by local guides, while development and more frequent intense storms were identified on Abaco. On Andros, perhaps a result of greater spatial extent, responses varied most greatly. Illegal poaching, over fishing, insufficient regulation and enforcement, changing climate, warmer water, pollution/garbage, submarine missile testing and radioactivity were all recognized, the latter two issues noted by guides in close proximity to the AUTECH U.S. naval base where underwater submarine tests are conducted.

#### **7.3.1 Angling pressure related threats**

Roughly, 34% guides reported poor angler handling of fish, population changes (shifts, declines), catch and release practices, and increased predation. Increased angler-driven tourism may be over stressing local fish populations causing either declines in stocks, or shifts in preferential habitats. Locations with a long history of angling appear

less productive prompting guides to state that fish are either in deeper water or they have moved elsewhere in response to more angling pressure. A lack of related scientific data prevent verification of these sentiments, although studies from Florida mirror results that indicate population declines (Kroloff, 2019). Although a multitude of variables are impacting populations, angling pressure is a factor.

Excessive unregulated growth of any fishery appears to have been detrimental to fish stocks. If impacts are significant enough, sustainability may be futile. However, with sufficient lapses of time, there may ultimately be reductions in angling pressure as anglers seek other destinations where there is less angling pressure, fish are less wary, and fish populations are greater. Hence a cycle of low stocks, resulting from environmental changes or over extraction, may be replaced with less tourism demand and a period of time for rejuvenation of stocks. This appears to be the case in Exuma where guides explained that bonefish numbers were dropping, but had more recently increased; they surmise the change is in response to less angling pressure due to closure of the single angling-dedicated lodge. This cyclical nature of predator prey populations is well understood in ecological studies (Abrams, 2000). Increased sightings may be attributable to actual population increases or other factors like shifting populations.

Poor handling practices and catch and release issues, were also commonly noted by guides. Over handling of fish and excessive exposure to air greatly magnify post release mortality in bonefish. Post release predation appears higher with poor handling, and guides unanimously agreed sharks of all species are more common than in the past. Guides explained that extraction of sharks in Bahamian waters is illegal, which may explain why shark populations are expanding. Single species protection of

sharks in The Bahamas may be a factor in the perceived decline of bonefish stocks. An ecosystem-based approach to marine management may be more effective at maintaining balance between species since protection of a prey species can have adverse short term affects on the prey populations (Watson et al., 2007).

### **7.3.2 Development related threats**

Development and loss of habitat were threats reported by 12.7% of all guides. Along with anthropocentric growth (e.g. development of mega resorts and increased boating traffic), there were specific concerns about increased boat traffic, and jet-ski use on bonefishing flats, this issue was particularly common in central Andros.

A common problem for tourism destinations, Anthropogenic developments frequently degrade local ecosystems, especially in fragile marine environments. Examples of tourism impacts on coastal environments include, mangrove losses (Ellison and Farnsworth, 1996), increased shoreline erosion (Jennings, 2004), and decline in corals (Hall, 2001).

### **7.3.3 Poaching related threats**

Illegal poaching concerns account for 9.2% of guide responses. Guides, particularly on Andros discussed Dominican commercial anglers illegally fishing Bahamian waters. Historically bonefish were used as bait for billfishing. A number of guides on Abaco stated illegal bonefish harvests still take place to be used as bait. Lastly, the use of fish pots and loss of angling gear were also noted issues. Fish pots indiscriminately indefinitely catch and kill fish of all species. Lost or discarded gear

remains active in marine environments and guides suggested these are responsible for declines in fish stocks.

#### **7.3.4 Bonefish netting related threats**

Netting was also a concern noted through 8.1% of guide responses, although netting of bonefish in Bahamian waters is illegal. Guides explained the practice used to be widespread but guide vigilantism has reduced the problem, perhaps however widening social and economic rifts already present as illustrated by Silvy et al. (2018). Many interviewed guides openly stated the physically forced “haulers” from bonefish grounds and actively damaged or destroyed their fishing gear in order to preserve bonefish.

#### **7.3.5 Environmental decline and change threats**

Climate and environmental change threats were noted in 6.3% of the responses. Few guides referred to the term “climate change” impacts, but it is probable that perceived threats they noted are resulting from global climate changes. These concerns arose most commonly on Andros, and secondly on Abaco. On Andros, several guides made note of warmer water temperatures earlier in the spring, and later into the fall, effectively forcing bonefish from the flats. This threat was internalized as a potential shortening of the season for guides. On Abaco, concern over more intense and frequent storms was repeatedly present in responses. Guides suggest more frequent and intense storms resulting from climate change, are continually wiping out yearly recruitments of bonefish stocks, preventing fish from maturing and reproducing. This in turn was a



rational for less large fish, more small fish and fewer fish overall. Other noted concerns merged into this category included, increased pollution and garbage on the flats, habitat losses, U.S. navy testing (on Andros), radioactivity and ecosystem imbalances in the form of more predators (sharks) and more turtles. Increased numbers of turtles were specifically noted by guides on Abaco where guides explained protected turtles (*sp.*) are overgrazing sea grass flats vital for bonefish habitat. They connected reductions in bonefish numbers to increases in turtle populations.

While guides from all study islands presented concerns, there does not appear to be one common threat facing the whole fishery. It is more likely a combination of factors including: loss of habitat, angling pressure, climate change, anthropocentric growth, pollution, poaching, lack of enforcement and others, that are negatively impacting the fishery and either causing population shifts or outright declines. Thus, sustainability of the fishery from a guide's perspective is questionable in light of responses provided for research questions related to environmental implications and fishery changes.

#### **7.4 Guide Knowledge Potentially Applied to Bahamian Resource Management**

There is no doubt that guide knowledge can, and should play, an important role in the management of resources in The Bahamas, in other related fisheries, and ore broadly, other sustainable tourism destinations. Guides spend more time on the water, or respective environment than any other individual, focusing their attention specifically on key target species, which makes them experts on these species. While guides in the case of bonefishing have particular targets for their clients, namely

bonefish, their time on the water affords them great opportunities to observe other species, giving them valuable insights beyond bonefish, tarpon and permit. This expertise should be sought out, to aid in the development of more holistic management related measures for all marine species. In fisheries like the Bahamian bonefishing industry, or in other data poor regions, professional angling guides hold valuable knowledge that can be used to help determine changes over time, vital for assessing stock vitality and ecosystem health. This is particularly true in recreational fisheries where catch data are not maintained as they are in commercial fisheries.

Guides interviewed for this study presented conservation-oriented ideals, innately aware of the importance of local ecosystems to their livelihood. They have a vested interest in ensuring healthy local systems, and they widely acknowledge the importance of the fishery to the wider economy and socio-cultural underpinnings of family island communities. Guides are frequently leaders in their communities (political or religious), giving them prominent roles, which can be used to help inform and educate others. Through extensive contact with elite clientele, guides acquire perspectives and experiences that are presumably not available to most Bahamians. These learned traits and contacts with influential individuals might help to better manage Bahamian marine resources if opportunities are provided for all stakeholders. Based on work completed by Hayes et al. (2015) and Silvy et al. (2018) on Andros, this necessity does not appear to have become reality.

## **7.5 Discussion**

At a scale focused on recreational bonefishing tourism, other studies examining sustainability from a guide's perspective, simply do not exist. Economic impact studies by Fedler (2010 and 2018) for example, suggest positive economic benefits of bonefishing to host populations, but his study is limited to economics alone and does not consider tourism sustainability from other perspectives. An emphasis on studies examining economic gain are common in the literature due to tangibility of finances and challenges associated with social and environmental considerations (Carlsen, 2016). Findings by Silvy et al. (2018), and Hayes et al. (2015), shed light on resident perceptions to the fishery on Andros, with conclusions that suggest sustainability of these fisheries is unlikely when examining potential benefits to the local population beyond noted benefits by guides. As Dluzewska (2018) points out, many publications conclude that host community attitudes and well-being are key to successes or failures of tourism destinations. Omitting local peoples affected by tourism, but not directly connected to the tourism sector might result in incongruences in vision, goals and management practices. The term 'hosts' should include locals in a tourism destination beyond those tied directly to that industry. In the case of bonefishing, 'hosts' need to include individuals other than guides, lodge owners, or other staff directly supporting a lodge (cooks, cleaners etc.). Well-being for locals is a fundamental underlying principle of sustainable tourism and while there is indirect and induced spending that results from Bahamian bonefishing, levels of inequality between guides and non-guides may overshadow these benefits. A wider interview base would be needed to more accurately assess these impacts.

Dluzewska (2018:512) examined well being of tourism hosts in relation to sustainable tourism ventures noting that ‘well-being’ was most commonly associated with economic benefit while other aspects of well-being are largely overlooked. Moreover it was concluded that due to the complexities of tourism and the assessment of benefits associated with tourism on local populations, “it makes it extremely difficult to correlate the tourism sector with specific indices of human well-being. Some of those are not even measurable, for example, the impact of tourism on longevity of various hosts....most of presented analysis of well-being in relation to sustainable tourism, can only be superficial and most concentrate solely on key elements”, like economic gain. Subjectivity of potential measurement indices related to wellbeing, potentially challenge research studies illustrating the scholarly dependence on quantifiable benefits like economics, which may not be an accurate measure of wellbeing. In essence, personal perspectives impact host responses. This is important to consider when determining wellbeing, and the degree of wellbeing enhancement that may result from local tourism opportunities. Interestingly, according to Schleicher et al., (2018) wellbeing appears tied to the state of the environment whereby hosts may perceive a state of positive wellbeing with a healthy ecosystem. When revisiting the results discussed by Silvy et al. (2018), this explains local perspectives of Androsian hosts not tied to the bonefishing industry but impacted by related exclusionary or elitist regulations, and a lack of control over their own resources. On a related yet grander scale, if sufficient proportions of any given host population begin to feel unhappy about a local tourism operation, the destination as a whole may be shut down, demonstrated

in recent destination closures like the Louvre in France, or on Mt. Everest climbing ventures (Lowrey, 2019).

From an environmental perspective, recent studies focusing on the Florida Keys bonefish fisheries by Santos et al. (2017), Santos et al. (2019), Frezza and Clem (2015), Brownscombe et al. (2019), Larkin et al. (2010), Larkin (2011), and Rehage et al. (2018) all identify bonefish population declines perceived by guides and anglers. These findings are completely congruent with results of this study in The Bahamas, results that ultimately jeopardize long-term sustainability of the Bahamian fishery if current 'management practices' are assumed. While noted threats appear to vary regionally, the overall trend has been a reduction in bonefish, both in the Florida Keys and according to guides, in The Bahamas. In the absence of healthy bonefish populations, travelling anglers may seek to travel elsewhere for better angling thus reducing potential benefits, like economic gain, from the fishery on local hosts tied to the business. Sustainability of the fishery from all pillars then becomes impossible.

From a broader perspective, recreational angling, a form of wildlife tourism, is grounded on human-wildlife interactions. Widespread acknowledgement of the negative results of such interactions is pervasive in the literature (Higginbottom et al., 2003). In a marine tourism context, studies on the impacts of feeding sharks (see Brunnschweiler et al., 2014), stingrays (see Concoran et al., 2013), and reef fish (see Feitosa et al., 2012) all identify behavioral changes associated with feeding interactions. Negative impacts of human interactions on marine and terrestrial wildlife include, disruption of behavior or physiological state, injury, stress, or mortality, habitat alteration, degradation or loss and extinction all together (Green & Higginbottom,

2001; Carlsen, 2016). From the perspective of this research, guides throughout the study individually noted each of these impacts affecting their local fisheries. (Fewer bonefish, shifted bonefish populations, higher predation, increased angling and boating pressure, more weary fish, loss of habitat, warmer water, pollution, garbage etc.) Despite extensive and pervasive negative impacts associated with human-wildlife integrations, it is vital to ensure these are mitigated in order to assure sustainability of any wildlife tourism destination (Semeniuk et al., 2010). Management of these resources is critical and according to Higginbottom et al., (2003:2), “most effective if it applied at a range of scales including the wildlife species, the natural area where a visited population occurs, and the individual tourism operation.” Implementation and enforcement of such policies become secondary problems leading to paper-park phenomena and in this Bahamas study, a viable concern according to guides. As previously discussed, an extensive geographical area, social and economic disparity in the general population, poaching and governmental inaction are all negatively impacting bonefishing in The Bahamas. Compounding these issues are seemingly unlimited plans for expansion of the fishery, as well as other tourism-based operations throughout the islands, noted by some Ministry of Tourism officials. All of these developments will impact the fishery.

While bonefishing is not exactly feeding fish to guarantee visitor satisfaction through close-up viewing, as is practiced widely in marine tourism destinations, the parallels are significant. In both cases, fish are enticed to a food or food-like item. In both cases, fish behavior and aggregations may be changed as a result of these interactions, and in both cases fish are presumably left ‘unharmmed’ until future similar

events occur. In a recent literature review by Patroni et al., (2017) on studies addressing feeding fish for tourism, 60% of 58 studies noted ecological impacts on the fish. Of these studies negative consequences extoll the need for improved management to set controls on tour operator activities, and more education for tourists. Failing to set limits and manage resources effectively may irreparably damage tourism destinations, bonefishing included. Lessons for Bahamian bonefishing may be possible if the Cuban bonefishing industry is examined. Throughout Cuba, select regions where bonefishing takes place are well managed and controlled. National marine parks like the Jardines de la Reina restrict resource extraction as well as angler access where it is permitted. Recreational angling is only allowed during specific angling seasons, and limits on the number of anglers permitted on a weekly basis are set, and strictly enforced. These management strategies act to reduce angling pressure, associated stresses, and post-release mortality (Davis, 2017), which according to guides in The Bahamas are all needed. In turn, angling quality in Cuba is perceived by anglers as very good, which works to ensure a consistent demand for the limited supply, and the ability for tour operators and guides to maintain high prices despite lower tourist supply.

The overall perceived decline in the bonefishing quality in The Bahamas is reason enough to conclude that sustainability of the tourism sector is unlikely. Add to this the noted challenges associated with guide training and guide recruitment, along with unregulated growth, lack of enforcement, and economic and social disparity between those in the industry versus those who are not, and sustainability appears impossible. All of this excludes the climate change implications associated with air

travel, which in and of itself put any form of sustainable tourism in question (Nepal et al., 2015) (See Appendix F).

Hall et al. (2013:114) argues “the more that is written about sustainable tourism the less sustainable it potentially appears to be.” In the case of Bahamian bonefishing when considering all the evidence provided, it seems unlikely that the fishery is sustainable under current operating procedures. Similar conclusions could be drawn on a wider perspective about any tourism destination when considering the totality of factors impacting local systems on which these destinations rely. Returning to Nepal et al., (2015), sustainable tourism may simply be an oxymoron in an ever growing world largely based on economic growth and resource use. Finite availability of resources may ensure this inevitability.

Despite this apparent pessimistic forecast, in the short term there are many benefits resulting from this fishery. As Fedler (2010 and 2018) and Southwick et al., (2016) explain, the economic benefit to small family island communities is vital. Significant economic prosperity has resulted from this fishery and has given local Bahamians employment where none previously existed. It has given some the potential to open lodges or diversify into other income generating markets. Moreover, the fishery has presumably increased education levels among guides, their families and their communities. Knowledge about the fishery has helped create a sense of stewardship and environmentalism, clearly evident in the interviews. These impacts are not unique to Bahamian bonefishing rather they are commonplace in ecotourism based communities (Scheyvens, 1999). So although the fishery may not be sustainable by definition, it is very important to many Bahamians. As a result of this fact, the more



that is learned and shared about this fishery, the more likely it will receive protections, which in turn will help make it more likely to become sustainable, benefitting more Bahamians. Increased awareness about threats facing the industry along with increased education will help address issues like inequality, while promoting stewardship ethics. Continued research is a vital component in this.

## **8. Summary, Conclusions and Recommendations**

Tourism is a rapidly growing sector of the greater global economy, and is particularly vital for SIDS where resource extraction is limited due to geography (Hampton and Jeyacheya, 2013). Tourism-related development inevitably stresses local ecosystems consequently more sustainable tourism practices are necessary to reduce negative effects associated with tourism developments. Sustainable tourism is defined by the UNWTO (2013) as, “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities”. In response to shifting cultural norms towards more ecocentric viewpoints, growth in ST has increased exponentially with many operations moving towards ecotourism. Rapid, and widespread growth in ST has lead to a growth paradox in tourism, whereby desirable economic growth and social improvements lead to negative environmental impacts on which the tourist destination relies (Carlsen, 2016).

Development of ecotourism and marine ecotourism ventures strive to minimize negative tourism impacts while maximizing sustainability, yet many activities covered under these eco-labels are questionably included. Commodification of wildlife at any scale results in behavioral and physiological changes in wildlife, threatening long-term sustainability of the activity. Recreational angling is commonly placed within the umbrella of ecotourism or ST, yet this categorization is questionable because of the impact on local fisheries.

Research pertaining to recreational angling is underrepresented in the literature. As Hinde (2014ba.) highlights, more research is needed on recreational fisheries as

sustainable tourism activities, on studies that employ qualitative methodologies, and on cases outside of the continental United States.

The Bahamas has a lengthy reliance on tourism, due in part to geographical proximity to the United States, lack of extractable resources, and an abundance of sun, sea and sand (Cleare, 2007). A proportionally small, yet economically and socio-culturally important sector of The Bahamian tourism industry centers on recreational angling for bonefish (*Albula sp.*) (Fedler, 2010, 2018; Southwick, 2016). Reliant on angling guides, this form of tourism is considered sustainable tourism throughout The Bahamas (Bahamas, 2017d.). Comprehensive analyses of these fisheries have to date omitted analysis from a sustainable tourism lens, or from the perspective of the hosts. Studies on the fishery thus far have focused on economic impacts and biophysical studies of the fish species including such behaviors as migration, growth, reproduction, aggregation sites and catch and release impacts.

This dissertation examined sustainability of Bahamian bonefishing, employing local ecological knowledge held by Bahamian angling guides. Interviews were conducted on Abaco, Andros, Bimini, Exuma and Grand Bahama from 2015 to 2017. A total of 71 guides were recruited for open-ended interviews, guided by a check-list of questions. Additionally, 17 interviews were conducted with industry professionals. Results suggest guides perceive the fishery to be sustainable from an economic standpoint (high employment rates, superior pay, and high job satisfaction evaluated through longevity), and to a lesser degree from a socio-cultural standpoint (status in the community, job satisfaction), while environmental impacts may be threatening the future of the fishery (fishery population declines, shifts, increased predation, warmer

waters, more pollution, increased angling pressure and boating traffic). Despite these findings, examination of the literature from Hayes et al. (2015) and Silvy et al. (2018) reveal economic and socio-cultural rifts existing between bonefishing industry insiders and Androsians not tied to this fishery. Evaluating similar rifts between industry insiders and outsiders elsewhere is not possible because similar studies do not exist for other Bahamian islands or other geographical locations experiencing similar fisheries. It is plausible that similar issues exist on other study islands because of similar conditions on other Family Islands. As Dluzewska (2019) explains, host perceptions and their wellbeing are directly tied to success of tourist destinations. Failing to ensure all hosts in a community benefit from tourism may cause social stratification, resentment, disregard for regulations and result in tourism apathy.

Despite all of this, this study demonstrates that angling guides in this fishery hold significant levels of environmental knowledge that can help to better understand local Bahamian ecosystems, to manage them, and help protect them. Management of similar recreational fisheries may also benefit from consultation with local angling guides and Adams (2019) reinforces this point suggesting the need for a mixed methods approach to fisheries management and conservation including the acquisition and use of local knowledge through collaboration. This conclusion is consistent with a General Systems Theory modeling approach recommended by Carlsen (2016) for tourism studies. The complexity of tourism and the multi-disciplinary nature of the field, dictate a more holistic evaluation of tourism sites including consideration of temporal changes as opposed to snap shot compartmentalized thinking, focused on economic impacts.

## **8.1 Guides Knowledge and Fisheries Management in The Bahamas**

Fisheries management is fundamentally management of stakeholders impacting, and impacted by a fishery; it is about managing people (Mahon and McConney, 2004). Effective fisheries management requires more than knowledge of the fishery itself, it requires awareness and understanding of human factors such as reaction of anglers to environmental, economic and social changes affecting the fishery (Hillborn, 2007). Resource managers implementing regulations need to consider implications for all stakeholders; co-management opportunities should be facilitated and encouraged (Jentoft, 2004). Principles of a fisheries management plan must match needs identified for different fisheries, and include customized mechanisms for each fishery. Components might include: justification and rational, underlying principles, regulations/management mechanisms, identification of stakeholders, an overall governance framework, a communication hierarchy, public education, enforcement programs, monitoring programs (synoptic and other), consideration of ecosystem services, fisheries biology, environmental impact assessments, tourism, commercial versus recreational implications, marine protected areas and other. Management mechanisms need to consider and possibly include such things as: vessel licensing, angler licensing, catch techniques, fisheries quotas, prohibition of certain angling devices (e.g. nets, dynamite, barbed hooks), identification of equipment restrictions (e.g. net mesh size, tackle line weight), implications for baiting fish, snagging fish, or use of fish traps.

For The Bahamas, geography dictates the need for a multidimensional approach, with island specific ecosystem management practices. A one-size fits all

approach will not satisfy the needs of stakeholders on all Bahamian islands because each island varies. This fact potentially reinforces the role that guides can play in effective fisheries management in The Bahamas because guides are a product of their island environment, and they are entwined within local economic, social, political and environmental structures. From a logistical perspective, guides can aid in many facets of a fisheries management plan. They can assist with inventory assessments (stock assessment), they can contribute valuable information about fish stock health studies (especially in recreational fisheries where stocks and health may be unknown), and they could help with designing regulations, quotas and permit systems. They can (and do in The Bahamas) aid in enforcement and in controlling poaching and netting. They could engage with the public on fisheries issues, plans and programs, they could assist with institutional redesign, act on review panels for fisheries department management planning reviews, they can help design and disseminate education materials, and elder or more experienced guides can help with guide training programs. Guides could help design restocking plans where possible, they can help with revenue generation, aid in fish tagging programs, restocking initiatives, and they can help in designing regulations for supporting fishing support services (e.g. lodges). Guides can also assist with natural disaster recovery in the fisheries sector and beyond (e.g. Hurricane Dorian for example), as well as annual monitoring of the system and the management processes generated to govern local fisheries (FAO, 2003).

In an unofficial capacity, guides in The Bahamas already fill many of these roles. Some have helped generate new recreational fishing regulations, some have helped with local public education programs, Bahamian guides have helped with

tagging programs, they have helped with natural disaster relief, and some have helped with guide training in the past. A challenge to effective management in The Bahamas lies with the inconsistent approach that has been used, in a top down driven management model, for management of all islands. This approach fails to consider the unique needs of highly varied islands. It is an approach that has divided rather than unified the recreational fishery. The development of recreational fisheries legislation in 2015, and later dismissal of these controversial regulations with a change in administration in 2016 illustrates this fact. A few individuals created these fisheries regulations for all Bahamians, and they simply did not fit the needs of all Bahamians. Considering the political ecology of the Bahamian fishery, detailed in Karrow and Thompson (2016), prospects for a unifying governing body, and consensus among stakeholders appears unlikely. As a result, effective management of Bahamian flats fisheries in the future remains likewise unlikely. Despite this, findings of this research clearly illustrate the valuable knowledge that guides hold, and the potential pivotal role they could play in management of their fisheries.

## **8.2 Key Findings**

Multiple key findings result from the work completed in this study.

- Bonefish guides in The Bahamas, tourism hosts, hold valuable insights about local ecosystems. Long time angling guides possess historical knowledge of fisheries population dynamics that is unavailable elsewhere since recreational fisheries are not subject to the same scrutiny as commercial fisheries. While

guides may not understand a specific biological process for example, their eyewitness accounts are valuable. Guides' perceptions can help determine fisheries changes, which in turn can help better manage these resources ensuring they are sustainably managed.

- Bahamian bonefishing is important to Family Island communities on Abaco, Andros, Bimini, Exuma and Grand Bahama. It is reasonable to conclude, similar positive impacts from this form of tourism may exist on other Bahamian islands where bonefishing occurs like Acklins Island, Long Island, Crooked Island, Eleuthera Island etc.
- Bahamian bonefishing guides perceive that bonefishing is currently sustainable from economic and socio-cultural points of view. Bonefishing is apparently a good source of employment for Bahamians. This form of employment appears to have provided guides with greater educational and economic gains than most Bahamians would be able to access. These opportunities in many cases have resulted in entrepreneurial advancements in the form of small business developments such as independent guiding operations, restaurants, car rentals, or establishment of bonefish/tourism lodges.
- When considering the economic or social benefit of bonefishing to the wider host population, sustainability is doubtful. Research by Hayes et al. (2015) and Silvy et al. (2018), provide results that demonstrate resentment towards the



elitist nature of the fishery, the prohibitive nature of regulations associated with bonefishing, and the exclusionary methodology in which the government developed and implemented fishery regulations. Further research on other islands in The Bahamas is needed to better address the full sustainability of these fisheries.

- When considering high leakage rates in The Bahamas and the high levels of imported goods to support tourism and local populations, sustainable tourism is doubtful. Lack of local resources and manufacturing infrastructure, common on SIDS, creates a dependence on foreign imports. This is unsustainable in the long run.
- Bahamian bonefishing sustainability may be in peril from environmental impacts. Noted environmental impacts include, changes in fishery stocks, shifts in populations, more pollution and garbage on bonefish flats, poor fish handling, more predation, loss of habitat, increased angling pressure, and increased development. Increased angling pressure and boat traffic are having adverse effects on fish populations and their habitats making fish more wary and harder to catch.
- Bonefish stocks have declined, while permit and tarpon stocks have remained largely stable. In select cases, increases and decreases in populations have been

observed, suggesting inter-island variability (e.g. permit populations have apparently increased in Grand Bahama).

- There is a deficiency in recruitment of new young Bahamian guides, and training for guides in The Bahamas is lacking.
- There is deficiency in fisheries regulations, in the consultation practice, and in the enforcement of existing regulations.
- Illegal poaching, loss of angling gear, technological advancements in the form of GPS and mother ship angling, all threaten bonefish populations and their habitat.
- Despite a multitude of negative impacts, Bahamian bonefishing provides employment for many Bahamians and a very good income. This has resulted in opportunities for personal enhancement, and for economic prosperity. Bahamian bonefishing has given guides opportunities to network with elite, wealthy, well-educated anglers who have transferred knowledge and provided opportunity. In many cases, stewardship principles have been promoted by anglers, adopted by guides and their families and in turn, guides are now providing valuable education to help protect their fishery.

### 8.3 Conclusions

Based on these key findings, the overarching deduction is that Bahamian bonefishing is unsustainable under current management practices and definitions. While guides unanimously view the fishery as economically and socially beneficial, guide attrition and challenges associated with guide training and recruitment both threaten the future of the fishery. When broadening the interview base to include community hosts not directly tied to the industry, sustainability of the fishery is even more unlikely. When considering environmental concerns noted by guides, sustainability is again further questioned. Compound these problems with ST limitations associated with climate change and air travel, excessive leakage rates in The Bahamas, and the inordinate dependence on imports to support tourism ventures in The Bahamas, and sustainability of bonefishing is impossible. Excluding climate change challenges associated with tourism, examples exist where through effective management; tourism destinations are made more sustainable. In the case of bonefishing, Cuba can provide a model for ST where regulations are imposed and enforced; angling seasons are limited, and angling pressure is controlled.

Beyond this scale of attention, this research reiterates the importance of consulting with local key stakeholders (in this case, bonefishing guides). Their observations and perceptions can provide valuable insights into sustainable tourism challenges and opportunities. Bahamian guides knowledge of fisheries however, indicate both constraints and limits (e.g., uncertainty, inconsistency) of that knowledge, but also opportunities (e.g., location specific habitat conditions) for sustainable recreational fisheries management. Researchers employing local knowledge need to be aware of

potential constraints (language barriers, indifference, ideological incongruences), as these are not unique to this study. Large sample sizes aid in deconstructing inconsistencies and uncertainties, but in some cases are not available as was the case on Bimini where only 4 guides exist. However, large sample sizes magnify the scale of research and the time and budgets required to facilitate these. Qualitative focused studies may be more likely to experience impacts associated with inconsistencies, lending researchers to seek quantitative approaches, more common in the literature. Despite this, as Hinde (2014b.) advocates, a greater emphasis on qualitative studies in fisheries are needed along with a multi-methods approach to management including local knowledge into the knowledge base (Adams, 2019). This study provided a case where qualitative analysis was the focus, and where the benefit of a mixed-methods approach is demonstrated. While the knowledge gained in this research is valuable, it needs to be considered with non-industry hosts and merged with data from other sources for a more holistic view of the fishery, thus incorporating a systems modeling approach. This strategy will result in a more sustainable tourism destination, if that can truly be achieved.

Beyond The Bahamas or other tourism destinations on the whole, the same lessons need consideration. Locals have first-hand knowledge about their local environments and should be included in management planning. Tourism inevitably impacts locals, and local ecosystems. Impacts may be beneficial economically, socially, or environmentally although examples of environmental benefit are sparse. Sustainably managing tourism destinations is vital for destination hosts and local environments, especially on SIDS reliant on tourism. Excessive tourism is detrimental, and

management practices need to consider long-term planning, or face collapse of local systems. This inevitability has been seen in countless examples around the world where wildlife tourism suffers from over use, and misuse. Overtourism (Capocchi et al., 2019), a term now widely used to describe tourism destinations suffering from uncontrolled demand and excessive use, impacts fragile ecosystems on a far smaller scale than popular urban destinations might be subject to. Failing to recognize ecosystem fragility, to set limits on tourism of any type or scale, and to regulate associated developments will result in ecosystem service declines and potential failures. For many destinations, especially SIDS tourism-based economies dependent on healthy ecosystems, the need to incorporate locals into the decision-making process for sustainable tourism planning, is vital.

#### **8.4 Recommendations**

To better ascertain the degree of sustainability of Bahamian bonefishing, and to work towards achieving some ST in the fishery, the following recommendations are presented:

- A precautionary principle should be applied to the existing industry in the form of a hold on new developments associated with bonefishing. Until a more thorough assessment of regional fish stocks can be conducted, and the impact of new lodges on existing establishments is determined, it would be prudent to cease development, and impose some regulations on future fishery-related

developments. Research shows bonefish have a limited home range hence regional populations are easily impacted.

- A comprehensive fisheries stock assessment should be conducted to better determine current population dynamics on each of the study islands examined in this dissertation. Similar studies should also be completed on other Bahamian islands where bonefishing exists, and in other tourism destinations relying on recreational angling for bonefish or other species.
- An initiative to encourage new guides needs to be implemented, along with a guide-training program. The Bahamian Ministry of Tourism offered a guide training program in the past, halted due to lack of funding. Funds need to be reallocated to this program in order to encourage youth to enter the profession. Funds garnered through angler licensing could be directed to this program.
- Educational programs need to be implemented to inform the general Bahamian populace about the fishery and the importance of the fishery to their livelihood and to the Bahamian economy. Funds garnered through angler licensing could be directed to this program.
- The government of The Bahamas needs to be encouraged to better manage, and regulate these fisheries with support from guides and other industry stakeholders. Enforcement needs to be enhanced. Guides, local stewards, or

wardens, may all be able to play a role in this and all require resources to achieve their goals along with related training. Funds garnered through angler licensing could be directed to this program.

- A similar study needs to be conducted on other Bahamian islands where bonefishing is important for the local economy including islands like, Acklins Island, Eleuthera Island, Long Island, Ragged Island and Crooked Island. Failing to assess these fisheries now, may result in greater consequences in their future. Loss of local ecological knowledge through attrition cannot be replaced. Comparing long-time Bahamian flats fisheries with lesser-known fisheries may provide interesting perspectives on angler impacts.
- Finally, a more systematic study of fishing lodge density, distribution, impact and ownership, lodge overall economic, social and environmental impacts, guide density, financial leakages, levels of import etc., should be carried out to ensure sustainability of lodge operations.

## **8.5 Scholarly Contributions**

Theoretically a substantial volume of material on bonefishing in The Bahamas has been acquired through this study including historical perspectives, economic and social benefits along with environmental impacts on and from the fishery. In the absence of such data prior to this study, the value gained from interviews conducted

during this research is invaluable. The Bahamas are considered a data-poor region and historically oral tradition due to high illiteracy rates was the norm. This study allowed for knowledge sharing, and acquisition in this data-poor region and the knowledge was captured tangibly.

In addition to valuable Bahamian fisheries related information, in many cases interviews diverged from the focus of this study yet content was acquired and transcribed. All of this content will prove invaluable in future studies, and will be stored at the University of The Bahamas, Department of Oral Tradition and History for scholarly use. Many of the guides interviewed were elderly at the time of interviewing, and some have since passed reinforcing the importance, and timeliness of this study. Their knowledge acquired through decades on the flats is irreplaceable, and to a small extent secured through interviews conducted as a part of this dissertation.

The use of local knowledge in resource management is now widespread. However qualitative analysis of these data are commonly overshadowed by quantitative studies that may be deemed more reliable in the scholarly community. Methodologically and empirically, this thesis adds to the body of qualitative studies. It also adds to the case study database outside of the United States and it adds to the volume of recreational angling tourism literature and tourism host studies.



## References

- Abrams, P.A. (2000) The evolution of predator-prey interactions: theory and evidence. *Annual Review of Ecology and Systematics*, 31:79-105.
- Acott, T., Trobe, H., and Howard, S. (1998). An evaluation of deep ecotourism and shallow ecotourism. *Journal of Sustainable Tourism*, 6(3), 238–253. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/09669589808667314>
- Adams, A., et al. 2012. *Albula vulpes*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2
- Adams, A. (2016) Guidelines for evaluation the suitability of catch and release fisheries: Lessons learned from Caribbean flats fisheries. *Fisheries Research*, 186. Sept. 2016. DOI: 10.1016/j.fishres.2016.09.027.
- Adams, A. and Cooke, S. (2015) Advancing the science and management of flats fisheries for bonefish, tarpon and permit. *Environmental Biology of Fishes*, 98(11) pp. 2123-2131.
- Adams, A., Rehage, J.S., and Cooke, S.J. (2019) A multi-methods approach supports the effective management and conservation of coastal marine recreational flats fisheries. *Environmental Biology of Fishes*, February 2019, Vol. 102, Issue 2. Pp. 105-115
- Agardy, M. T. (1993). Accommodating Ecotourism in Multiple Use Planning of Coastal and Marine Protected Areas. *Ocean and Coastal Management*, 20, 219–239.
- Albury, P. (1975) The Story of The Bahamas. MacMillan Publishing, Oxford. Pp. 289.
- Allen, L.R., Hafer, H.R., Long, P.T., and Perdue, R.R. (1993), “Rural residents’ attitudes toward recreation and tourism development”, *Journal of Travel Research*, (Spring) 27-33.
- Ames, T. (1998). Putting fishermen’s knowledge to work: the promise and pitfalls. *Stonington Fisheries Alliance*, 184–188. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.117.859>
- ANCAT (2014) - Andros Conservacny and Trust. [www.ncat.org](http://www.ncat.org)
- André, P., Enserink, B., Connor, D., and Croal, P. (2006). Public participation international best practice principles. *IAIA, Special Publication Series*, (4). Retrieved from

<http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Public+Participation:+International+Best+Practice+Principles#0>

- Ap, J. (1992), "Residents' perceptions on tourism impacts", *Annals of Tourism Research*, 19: 665-690.
- Arlinghaus, R, Cooke, S., and Potts, W. (2013). Towards resilient recreational fisheries on a global scale through improved understanding of fish and fisher behaviour. *Fisheries Management and Ecology*, 91–98. doi:10.1111/fme.12027
- Armitage, D., and Berkes, F. (2007) Adaptive co-management: collaboration, learning and multi-level governance. Vancouver, UBC Press, pp. 344
- Arnstein, S. R. (1969). A Ladder Of Citizen Participation. *Journal of the American Institute of Planners*, 35(4), 216–224. doi:10.1080/01944366908977225
- AUTEC (2017) Atlantic Undersea Test and Evaluation Center.  
<http://www.navsea.navy.mil/Home/Warfare-Centers/NUWC-Newport/What-We-Do/Detachments/AUTEC/>. Accessed, May, 2017.
- Bahamas Fly Fishing Industry Association (2014). [www.bffia.org](http://www.bffia.org) accessed Sept, 2014
- Bahamas Sportfishing Conservation Association (2014) [www.bsca.org](http://www.bsca.org) accessed Sept. 2014
- Bahamas, T. (2012). Research and statistics department bahamas ministry of tourism` 2012. Retrieved from <http://www.tourismtoday.com/home/statistics/>
- Bahamas T. (2010). *2010 Census of Population and Housing*. Nassau, Bahamas. Retrieved from <http://www.tourismtoday.com/home/statistics/> accessed May, 2015
- Bahamas, T. (2017a.). Retrieved June 10th, 2017, from <http://worldpopulationreview.com/countries/bahamas-population/>
- Bahamas, T. (2017b.)  
[https://www.bahamas.gov.bs/wps/portal/public/Education/Bahamahost%20Certification%20Programme!/ut/p/b1/vZLLcqJAFIafxQcwNNgNcdlcBOQqd9hQgKByU0BFePoxU7NIpWqSWUxyzqqrj7f6b-aiLiAiNrKfjok19O5Teq3c0THKyBqGMNXTUSABrJrqthkJMow4RMIPwEg-Oq-TwTbcKVygzxuBCu-RMOwmxg\\_6VX33CFBcIqr1TDz5qK4utmj32XaI8pDG0tjezHnPnjIVOpfbCiFCvbc6NeaK63p40rmYE-p4ZtJwX91F1ZDLswFmCtVZlgS9gJE\\_tq9oE6P4q1mWWMHO3WWPBVKgX-xdtQj6yJbYV3bqxVtY7bbBK34scf46gZCfrmmz1ATMsm8JlJpmzGgNtXCz-5AH-Uvgf8og-RSj0BfAW-W\\_gkx3CJ8C8m-](https://www.bahamas.gov.bs/wps/portal/public/Education/Bahamahost%20Certification%20Programme!/ut/p/b1/vZLLcqJAFIafxQcwNNgNcdlcBOQqd9hQgKByU0BFePoxU7NIpWqSWUxyzqqrj7f6b-aiLiAiNrKfjok19O5Teq3c0THKyBqGMNXTUSABrJrqthkJMow4RMIPwEg-Oq-TwTbcKVygzxuBCu-RMOwmxg_6VX33CFBcIqr1TDz5qK4utmj32XaI8pDG0tjezHnPnjIVOpfbCiFCvbc6NeaK63p40rmYE-p4ZtJwX91F1ZDLswFmCtVZlgS9gJE_tq9oE6P4q1mWWMHO3WWPBVKgX-xdtQj6yJbYV3bqxVtY7bbBK34scf46gZCfrmmz1ATMsm8JlJpmzGgNtXCz-5AH-Uvgf8og-RSj0BfAW-W_gkx3CJ8C8m-)

[B4AMgkwJZN7gB0AeEQAYCxxU4Xea5mq5zt2REequ3Cmew9TWPSne4281W3dLs0RiCQilZmpONo08Czuq7z5t6zXBbjUsuQ\\_1FoUM76KeRIWnERsI1vF4rIeH1mxDgmRhQQIfnTwtWPRiqaxve\\_8MOnQf9duCWiU9q8jFnzAl7Qs2ga0vQKkCQCIPDKED7SUX7wchBPJ5CPERMp3HmwEq4bkV-\\_XsFGuFW2Bdsj1NflYb\\_zLvcielZoSRnK3XsFqqywl-aWHE-xnstXTIJZdxSFb5oHGK\\_kwGN02r9RTiUst66WySN3ioKD7SuK6sDYSrWBQpwfipPDLiUdHPp532YGig6TfeDjMKPcuxfdFOXY6NAYqOWk1GNphu6KGtAtQQ0DL\\_uIa5XzskEiMAoqlDupVPoWemAjzrFI8cztIBo1HddSdGoqjBeELp2bnLg0712ILWkO3nWOF78AIWZL1A!/dl4/d5/L2dBISEvZ0FBIS9nQSEh/](https://www.bahamas.gov.bs/wps/portal/public/recreation%20and%20sports/fishing/sports%20fishing%20regulations!/ut/p/b1/vZTJbqMwAEC_pR-QYrNzJEAhwexLgAtiSQkhQBjDCHz9pKM5VJUmM4fp2CdLz37yk2UiISi6bJbXWVD3XfZ6WodsCkFVEMUad5QGcCCTWAj0eY00mLYBxA_AWjwp_07IkIxxRS8qWQITA8OROu6L1GA014AtFIgGWeKzNp7xEo9w5DJzHgx5a1gH2RMwZXde65nKkQH_d3Npdt1t0GWS50p0JyUJrgaJ3g5TeEg7g7nYDJm9MYyNgrtYRfrmgYV1WJf1TVtFyVzyimh2kijPWEwS3EHhVbiS6s-BIYZ3_K9RJkzpmXuXmwbQetcd-QQnfbr8txJ7PTy8qsF-M0Q_6JF8hT5qPkTeKZ4eoJDEvED4D4BfgjABgLR9aADaI0kfCICdOod5_NmaRb3uLhb_-oaBudMsIFbM-ACMzghT7CgqfR3EEDDaATLRA4wr8Y0DL5dhm6wFtflu-K2X4UW6QsPoQRZPWCAZ8HvFqqMxT8ScL4tMiRQdfC_hf83qWpb1Lff8Muj=-ffCLZHUefs6Fe0reKUYnuYEgaVJnmRZyBHhMWbvDd5MsuKm9xjqWB1ZNm1Ehzfo2t1y93PM41qeBLKU5jPO9ZEcTX3objlUYNRLa5IpIWlkc6c14sgkxjGcwqiSzCkwV5d-k7eut0VR5PtLuO-kN0YY9xUYBK19i9RBwalVj_l6qK2qJk0titop1KZM2s6Ol_k6xhx1sJCXZJMGJEzh42guSzlwuBTEq3yB6knhhGt1YZZ0dACs5Y0J8OBk5gE4yy7lu6MdccXqllZFa_M8f9th91ZUjy_G1Pp2T5zb4IZYV1uiT3MvvvwAPIBuoQ!/dl4/d5/L2dBISEvZ0FBIS9nQSEh/) accessed, June, 2017.

Bahamas, T. (2017c.)

[https://www.bahamas.gov.bs/wps/portal/public/recreation%20and%20sports/fishing/sports%20fishing%20regulations!/ut/p/b1/vZTJbqMwAEC\\_pR-QYrNzJEAhwexLgAtiSQkhQBjDCHz9pKM5VJUmM4fp2CdLz37yk2UiISi6bJbXWVD3XfZ6WodsCkFVEMUad5QGcCCTWAj0eY00mLYBxA\\_AWjwp\\_07IkIxxRS8qWQITA8OROu6L1GA014AtFIgGWeKzNp7xEo9w5DJzHgx5a1gH2RMwZXde65nKkQH\\_d3Npdt1t0GWS50p0JyUJrgaJ3g5TeEg7g7nYDJm9MYyNgrtYRfrmgYV1WJf1TVtFyVzyimh2kijPWEwS3EHhVbiS6s-BIYZ3\\_K9RJkzpmXuXmwbQetcd-QQnfbr8txJ7PTy8qsF-M0Q\\_6JF8hT5qPkTeKZ4eoJDEvED4D4BfgjABgLR9aADaI0kfCICdOod5\\_NmaRb3uLhb\\_-oaBudMsIFbM-ACMzghT7CgqfR3EEDDaATLRA4wr8Y0DL5dhm6wFtflu-K2X4UW6QsPoQRZPWCAZ8HvFqqMxT8ScL4tMiRQdfC\\_hf83qWpb1Lff8Muj=-ffCLZHUefs6Fe0reKUYnuYEgaVJnmRZyBHhMWbvDd5MsuKm9xjqWB1ZNm1Ehzfo2t1y93PM41qeBLKU5jPO9ZEcTX3objlUYNRLa5IpIWlkc6c14sgkxjGcwqiSzCkwV5d-k7eut0VR5PtLuO-kN0YY9xUYBK19i9RBwalVj\\_l6qK2qJk0titop1KZM2s6Ol\\_k6xhx1sJCXZJMGJEzh42guSzlwuBTEq3yB6knhhGt1YZZ0dACs5Y0J8OBk5gE4yy7lu6MdccXqllZFa\\_M8f9th91ZUjy\\_G1Pp2T5zb4IZYV1uiT3MvvvwAPIBuoQ!/dl4/d5/L2dBISEvZ0FBIS9nQSEh/](https://www.bahamas.gov.bs/wps/portal/public/recreation%20and%20sports/fishing/sports%20fishing%20regulations!/ut/p/b1/vZTJbqMwAEC_pR-QYrNzJEAhwexLgAtiSQkhQBjDCHz9pKM5VJUmM4fp2CdLz37yk2UiISi6bJbXWVD3XfZ6WodsCkFVEMUad5QGcCCTWAj0eY00mLYBxA_AWjwp_07IkIxxRS8qWQITA8OROu6L1GA014AtFIgGWeKzNp7xEo9w5DJzHgx5a1gH2RMwZXde65nKkQH_d3Npdt1t0GWS50p0JyUJrgaJ3g5TeEg7g7nYDJm9MYyNgrtYRfrmgYV1WJf1TVtFyVzyimh2kijPWEwS3EHhVbiS6s-BIYZ3_K9RJkzpmXuXmwbQetcd-QQnfbr8txJ7PTy8qsF-M0Q_6JF8hT5qPkTeKZ4eoJDEvED4D4BfgjABgLR9aADaI0kfCICdOod5_NmaRb3uLhb_-oaBudMsIFbM-ACMzghT7CgqfR3EEDDaATLRA4wr8Y0DL5dhm6wFtflu-K2X4UW6QsPoQRZPWCAZ8HvFqqMxT8ScL4tMiRQdfC_hf83qWpb1Lff8Muj=-ffCLZHUefs6Fe0reKUYnuYEgaVJnmRZyBHhMWbvDd5MsuKm9xjqWB1ZNm1Ehzfo2t1y93PM41qeBLKU5jPO9ZEcTX3objlUYNRLa5IpIWlkc6c14sgkxjGcwqiSzCkwV5d-k7eut0VR5PtLuO-kN0YY9xUYBK19i9RBwalVj_l6qK2qJk0titop1KZM2s6Ol_k6xhx1sJCXZJMGJEzh42guSzlwuBTEq3yB6knhhGt1YZZ0dACs5Y0J8OBk5gE4yy7lu6MdccXqllZFa_M8f9th91ZUjy_G1Pp2T5zb4IZYV1uiT3MvvvwAPIBuoQ!/dl4/d5/L2dBISEvZ0FBIS9nQSEh/)

Bahamas, T (2017d.) Personal communication, Mr. G. Lloyd, Department of Marine Resources, Nassau, Bahamas.

Balick, M. J. (2007). Traditional Knowledge:Lessons from the Past, Lessons for the Future. In C. McManis (Ed.), *Biodiversity and the Law* (pp. 280–296). Sterling, VA: Earthscan.

Barrow, C. J. (1995) Sustainable development: concept, value and practice, *Third World Planning Review* 17(4) 369- 386.

Bartholomew, A., and Bohnsack, J. a. (2005). A Review of Catch-and-Release Angling Mortality with Implications for No-take Reserves. *Reviews in Fish Biology and Fisheries*, 15(1-2), 129–154. doi:10.1007/s11160-005-2175-1.

- Beaudreau, A., and Levin, P. (2014). Advancing the use of local ecological knowledge for assessing data-poor species in coastal ecosystems. *Ecological Applications*, 24(2), 244–256. Retrieved from <http://www.esajournals.org/doi/abs/10.1890/13-0817.1>
- Benaka, L. (1999). Fish Habitat: Essential Fish Habitat and Rehabilitation. *American Fisheries Society, Bethesda, MD*.
- Bergmann, M., Hinz, H., Blyth, R. ., Kaiser, M. ., Rogers, S. ., and Armstrong, M. (2004). Using knowledge from fishers and fisheries scientists to identify possible groundfish “Essential Fish Habitats.” *Fisheries Research*, 66(2-3), 373–379. doi:10.1016/j.fishres.2003.07.007
- Bergold, J. (2007). Participatory strategies in community psychology research—a short survey. In A. Bokszczanin (Ed.), *Poland welcomes community psychology: Proceedings from the 6th European Conference on Community Psychology* (pp.57-66). Opole: Opole University Press.
- Bergold, J., and Thomas, S. (2012). Participatory Research Methods: A Methodological Approach in Motion [110 paragraphs]. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 13 (1). Art. 30, <http://nbn-resolving.de/urn:nbn:de:0114-fqs1201302>.
- Berkes, F. (2012). *Sacred Ecology* (3rd. Ed., pp. 1–355). New York and London: Routledge, Taylor and Francis Group.
- Berkes, F., Colding, J., and Folke, C. (2000). Rediscovery of Traditional Ecological Knowledge as Adaptive Management. *The Ecological Society of America*, 10(October), 1251–1262.
- Bergmann, M., Hinz, H., Blyth, R. ., Kaiser, M. ., Rogers, S. ., and Armstrong, M. (2004). Using knowledge from fishers and fisheries scientists to identify possible groundfish “Essential Fish Habitats.” *Fisheries Research*, 66(2-3), 373–379. doi:10.1016/j.fishres.2003.07.007
- Black, B.D., Adams, A.J., and Bergh, C. (2015) Mapping stakeholder activities and habitat to inform conservation planning for a national marine sanctuary. *Environmental Biology of Fishes*, 98: 11, pp 2213-2221. <https://doi.org/10.1007/s10641-015-0435-z>
- Blamey, R. (1997). Ecotourism: The search for an operational definition. *Journal of Sustainable Tourism* 5, 109–130.
- Bohensky, E. L., and Maru, Y. (2011). Indigenous Knowledge , Science , and Resilience : What Have We Learned from a Decade of International Literature on “ Integration ”? *Ecology and Society*, 16(4).

- Bonny, E., and Berkes, F. (2008). Communicating traditional environmental knowledge : addressing the diversity of knowledge , audiences and media types, *44*(230), 243–253. doi:10.1017/S0032247408007420
- Boo, E. (1990). *Ecotourism: The Potentials and Pitfalls Volume 1*. Washington DC: World Wildlife Fund (WWF).
- Bookbinder, M.P., Dinerstein, E., Rijal, A., Cauley, H., and Rajouria, A. (n.d.). Ecotourism's support of biodiversity conservation. *Conservation Biology*12, 1399–1404.
- Borsch, T., Aas, O., and Policansky, D. (2008). International Fishing Tourism. In H. L. J. Aas, O., Arlinghaus, R., Ditton, R.B., Policansky, D., and Schramm (Ed.), *Global Challenges in Recreational Fisheries* (pp. 268–291). Singapore: Blackwell Publishing.
- Bramwell, B., and Lane, B. (1993). Sustainable tourism: An evolving global approach. *Journal of Sustainable Tourism*, 1(1), 1–5.
- Bramwell, B., and Lane, B. (2014). What drives research on sustainable tourism? *Journal of Sustainable Tourism*, 23(1), 1–3. doi:10.1080/09669582.2014.970407
- Bramwell, B., Henry, I., Jackson, G., Prat, A.G., Richards, G., and van der Straaten, J. (1996) *Sustainable Tourism Management: Principles and Practice*, Tilburg: Tilburg University Press.
- Brightsmith, D., Stronza, A., and Holle, K. (2008). Ecotourism, conservation biology, and volunteer tourism: A mutually beneficial triumvirate. *Biological Conservation*, 141(11), 2832–2842. doi:10.1016/j.biocon.2008.08.020
- Broad, K., and Sanchirico, J. N. (2008) Local Perspectives on Marine Reserve Creation in The Bahamas. *Ocean and Coastal Management*, 51(11). Pp 763-771
- Brown, D. (2008). *Fly Fishing for Bonefish*. Guilford, CT.: Lyons Press.
- Brownscombe, J.W., Danylchuk, A.J., and Adams, A.J. (2019) Bonefish in South Florida: status, threats and research needs. *Environmental Biology of Fishes*, Vol. 102:2. Pp. 329-348.
- Brunnschweiler, J., Abrantes, K., & Barnett, A. (2014). Long-term changes in species composition and relative abundances of sharks at a provisioning site. *PLoS One*, 9(1), e86682. <https://doi.org/10.1371/journal.pone.0086682>.
- Bryant, R.L. and Goodman, M.K. (2004) Consuming narratives: The political ecology of “alternative consumption”, *Transactions of the Institute of British*

- Geographers*, 29(3): 344-366.
- Buckley, R.C. (2009) *Ecotourism: Principles and Practices*. Wallingford: CABI.
- Buckley, R. (2012). Sustainable tourism: Research and reality. *Annals of Tourism Research*, 39, 528–546.
- Budi Utomo, P. (2010). The Role of Traditional Knowledge in Fisheries Management : Republic of Indonesia. *Master of Science Dissertation*.
- Bunce, M., Rodwell, L. D., Gibb, R., and Mee, L. (2008). Shifting baselines in fishers' perceptions of island reef fishery degradation. *Ocean & Coastal Management*, 51(4), 285–302. doi:10.1016/j.ocecoaman.2007.09.006.
- Burger, G. (1974). Age, growth, food habits and reproduction of bonefish, *Albula vulpes* in South Florida waters. *Florida Marine Research Publication*, 3: 1-20
- Burruss, G, M. (2018) Movement of Bonefish (*Albula spp.*) in The Bahamas: Multiple Migration Routes and Associated Environmental Cues. Masters Thesis, Michigan State University, Ann Arbor, Michigan. Pp. 24.
- Burton, F. (1998). Can tourism objectives be met? *Annals of Tourism Research*, 25(3), 755–758.
- Butler, R.W. (1998). Sustainable tourism -Looking backwards to progress? In Hall, M., and Lew, A. (Ed.), *Sustainable Tourism: a Geographical Perspective* (pp. 25– 34). Longman, Harlow, UK.
- Butler, R.W. (1998) Sustainable tourism – looking backwards in order to progress?, In Hall, M. and Lew, A. (Eds.), *Sustainable Tourism: A Geographical Perspective*. (pp. 25-34), Essex, UK., Addison Wesley Longmann Limited.
- Butler, R.W. (1991) Tourism, environment, and sustainable development, *Environmental Conservation*, 18(3), 201- 209.
- Butler, R.W. (1992). Ecotourism: it's changing face and evolving philosophy. In *International Union for Conservation of Nature and Natural Resources (IUCN)* Caracas, Venezuela: IVth World Congress on National Parks and Protected Areas.
- Butler, R.W. (1992) Alternative tourism: the thin edge of the wedge, NV. Smith & W. Eadington (eds.) *Tourism alternatives: potentials and problems in the development of Tourism*, University of Pennsylvania Press, Philadelphia, 31- 36.
- Butler, R.W. (1999) Sustainable Tourism: a state-of-the-art-review. *Tourism Geographies*, 1(1) 7-25 DOI: 10.1080/14616689908721291

- Butler, R.W. (2015) Sustainable tourism: paradoxes, inconsistencies and a way forward?, In, *The Practice of Sustainable Tourism: Resolving the paradox*. Hughes, M., Weaver, D., and Pforr, C. (eds.) Routledge Publishing, New York, NY., pp 303.
- Butler, J. R. A., Tawake, A., Skewes, T., Tawake, L., and Mcgrath, V. (2012). Integrating Traditional Ecological Knowledge and Fisheries Management in the Torres Strait , Australia : the Catalytic Role of Turtles and Dugong. *Ecology and Society*, 17(4).
- Campbell, S. (1996). Green cities, growing cities, just cities? Urban planning and the contradictions of sustainable development. *Journal of the American Planning Association*, 62(3), 296–312.
- Capocchi, A., Vallone, C., Pierotti, M., and Amaduzzi, A. (2019) Overtourism: a literature review to assess implications and future perspectives. *Sustainability*, 11:3303.
- Caribjournal (2017) Carnival building major new port in Grand Bahama, *Caribjournal*. <https://www.caribjournal.com/2017/05/03/carnival-building-major-new-port-grand-bahama/>. Accessed, August, 2019.
- Carlsen, J. (2016) Island Tourism: Systems modeling for sustainability. In M. Hughes, D. Weaver and C. Pforr (Eds.) *The Practice of Sustainable Tourism*, (pp. 83-94) Routledge Publishing, New York, NY.
- Carpiano, R.M. (2009). Come take a walk with me: The “go along” interview as a novel method for studying the implications of place for health and well-being. *Health & Place*, 15(1), 263–272.
- Carson, R. (1963) *Silent Spring*. London: Hamish Hamilton.
- Carter, C., and Carter, E. (2001). Marine Environments. In D. B. Weaver (Ed.), *The Encyclopedia of Ecotourism* (pp. 265–282). New York, NY: CABI Publishing.
- Carter, C., and Carter, E. (2007). *Marine Ecotourism: Between the Devil and the Deep Blue Sea* (pp. 1– 306). Wallingford, MA: CABI Publishing.
- Ceballos-Lascurain, H. (1996). *Tourism, ecotourism and protected areas: the state of nature-based tourism around the world and guidelines for its development*. Gland, Switzerland and Cambridge, UK.
- Cisneros-Montemayor, A. (2011). The economic value and potential threats to marine ecotourism in Belize. In D. Palomares, M.L.D, and Pauly (Ed.), *Too Precious to Drill: the Marine Biodiversity of Belize*. (Fisheries ., Vol. 19, pp. 161–166). University of British Columbia. Retrieved from

<http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:The+Economic+Value+and+Potential+Threats+to+Marine+EcoTourism+in+Belize#0>

- Cleare, A.B. (2007). History of Tourism in The Bahamas: A Global Perspective. Xlibris Corporation. Pp. 619.
- Clements, C. J., Schultz, J.H., and Lime, D.W. (1993), "Recreation, Tourism, and the Local Residents: Partnership or Co-existence?" *Journal of Park and Recreation Administration*, 11(4) 78-91.
- Charlton, C. (1998) Public transport and sustainable tourism: the case of the Devon and Cornwall rail partnership. In Hall, M. and Lew, A. (Eds.), *Sustainable Tourism: A Geographical Perspective*. (pp. 132-145), Essex, UK., Addison Wesley Longmann Limited.
- Cohen, E., and Cohen, S. A. (2012). Current sociological theories and issues in tourism. *Annals of Tourism Research*, 39(4), 2177–2202. doi:10.1016/j.annals.2012.07.009
- Colborn, J., R.E. Crabtree, J.B. Shaklee, E. Pfeiler, and B.W. Bowen. 2001. The evolutionary enigma of bonefishes (*Albula* spp.): cryptic species and ancient separations in a globally distributed shorefish. *Evolution* 55(4):807-820.
- Conway, D., and Timms, B. F. (2010). Re-branding alternative tourism in the Caribbean: The case for "slow tourism." *Tourism and Hospitality Research*, (Oct.), 3290344.
- Cooke, S. J., and Cowx, I. G. (2006). Contrasting recreational and commercial fishing: Searching for common issues to promote unified conservation of fisheries resources and aquatic environments. *Biological Conservation*, 128(1), 93–108. doi:10.1016/j.biocon.2005.09.019
- Cooke, S. J., Danylchuk, A. J., Danylchuk, S. E., Suski, C. D., and Goldberg, T. L. (2006). Is catch-and-release recreational angling compatible with no-take marine protected areas? *Ocean & Coastal Management*, 49(5-6), 342–354. doi:10.1016/j.ocecoaman.2006.03.003
- Cooke S. J., and Philipp D. P. (2004) Behavior and mortality of caught and-released bonefish (*Albula* spp.) in Bahamian waters with implications for a sustainable recreational fishery. *Biological Conservation*, 118:599–607
- Cooke, S. J., and Sneddon, L. U. (2007). Animal welfare perspectives on recreational angling. *Applied Animal Behaviour Science*, 104(3-4), 176–198. doi:10.1016/j.applanim.2006.09.002
- Cooke, S. J., and Suski, C. D. (2005). Do we need species-specific guidelines for catch-and-release recreational angling to effectively conserve diverse fishery resources?



*Biodiversity and Conservation*, 14(5), 1195–1209. doi:10.1007/s10531-004-7845-0

- Coombes, B., Johnson, J. T., and Howitt, R. (2011). Indigenous geographies I: Mere resource conflicts? The complexities in Indigenous land and environmental claims. *Progress in Human Geography*, 36(6), 810–821. doi:10.1177/0309132511431410
- Corcoran, M. J., Wetherbee, B. M., Shivji, M. S., Potenski, M. D., Chapman, D. D., and Harvey, G. M. (2013). Supplemental feeding for ecotourism reverses diel activity and alters movement patterns and spatial distribution of the southern stingray, *Dasyatis americana*. *PLoS One*, 8(3), e59235. <https://doi.org/10.1371/journal.pone.0059235>.
- Cordell, K. (2004). *Outdoor Recreation for the 21st Century America*. Venture Publishing, Pennsylvania.
- Countryside Commission (1995) Sustaining Rural Tourism (CCP, 483), Cheltenham: Countryside Commission.
- Crabtree, R., Stevens, D. and Stengard, F. (1998). Feeding habits of bonefish, *Albula vulpes* from waters of the waters of the Florida Keys. *Fishery bulletin*, 96(4): 754-766.
- Crabtree, R., Handen, C., Snodgrass, D. and Stevens, C. (1996). Age, growth and mortality of bonefish, *Albula vulpes*, from the water of the Florida Keys. *Fishery bulletin*, 94(3): 442-451.
- Craton, M. (1986). *A History of the Bahamas* (3rd ed., pp. 1–332). Waterloo, Ontario, Canada: San Salvador Press.
- Craton, M., and Saunders, G. (1999) *Islanders in the Stream*. A history of the Bahamian people, volume 1. The University of Georgia Press, London. Pp.355.
- Craton, M. ,and Saunders, G. (2000) *Islanders in the Stream*. A history of the Bahamian people, volume 2. The University of Georgia Press, London. Pp.562.
- Crick M. 1989. Representations of international tourism in the social sciences: sun, sex, sights, savings, and servility. *Annual Review of Anthropology*, 18:307–44
- Croall, J. 1995. *Preserve or Destroy: Tourism and the Environment*. London: Calouste Gulbenkian Foundation.
- Cukier, J. (2002). Tourism employment issues in developing countries: Examples from Indonesia. In R. Sharpley, & D. J. Telfer (Eds.), *Tourism and development, concepts and issues* (pp. 165–201). Clevedon: Channel View Publications.

- Dahlgren, C., Shenker, J.M., and Mojica, R. (2008) Ecology of Bonefish during the transition from late larvae to early juveniles. In, *The Biology and Management of the World Tarpon and Bonefish Fisheries*. Jerald S. Ault ed. CRC Press, Taylor and Francis Group, New York. Pp.155-178.
- Dale, A., and Armitage, D. (2011). Marine mammal co-management in Canada's Arctic: Knowledge co-production for learning and adaptive capacity. *Marine Policy*, 1–10. doi:10.1016/j.marpol.2010.10.019
- Danielsen, F., Jensen, P. M., Burgess, N. D., Coronado, I., Holt, S., Poulsen, M. K., and Pirhofer-Walzl, K. (2014). Testing focus groups as a tool for connecting indigenous and local knowledge on abundance of natural resources with science-based land management systems, *00*(April), 1–10. doi:10.1111/conl.12100
- Danylchuk, S. E., Danylchuk, A. J., and Cooke, S. J. (2007). Effects of recreational angling on the post-release behavior and predation of bonefish (*Albula vulpes*): The role of equilibrium status at the time of release. *Journal of Experimental Marine Biology and Ecology*, 346, 127–133. doi:10.1016/j.jembe.2007.03.008
- Danylchuk, A.J., Adams, A. Cooke, S., and Suski, C.D. (2008) An evaluation for the injury and short-term survival of bonefish (*Albula sp.*) as influenced by a mechanical lip-gripping device used by recreational anglers. *Fisheries Research*. Vol 93(1) pp.248-252.
- Danylchuk A.J., Danylchuk S.E., Cooke S.J., Goldberg T.L., Koppelman J., and Philipp D.P. (2007) Postrelease mortality of bonefish, *Albula vulpes*, exposed to different handling practices during catch-and-release angling in Eleuthera, the Bahamas. *Fisheries Management Ecology*. 14:149–154
- Davis, I. (2017) Personal communication. Yellow Dog Fly Fishing Adventures.
- Deery, M., Jago, L., and Fredline, L. (2012). Rethinking social impacts of tourism research: A new research agenda. *Tourism Management*, 33(1), 64–73. doi:10.1016/j.tourman.2011.01.026
- Department of Fisheries (2003) 'Fisheries Rules and Regulations'. The Bahamas Department of Fisheries, Nassau, Bahamas.
- Department of Marine Resources. (2013). Fishery Product/ Resource Exports for CY 2013. Nassau: Department of Marine Resources.
- Devall, B. and Sessions, G. (1985). *Deep Ecology: Living as if Nature Mattered*. Layton, Utah: Gibbs M. Smith Inc.
- Devin, S., and Doberstein, B. (2004). Traditional Ecological Knowledge in Parks Management: A Canadian perspective. *Environments- A Journal of*

*Interdisciplinary Studies*. Retrieved from  
<http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Traditional+Eco+logical+Knowledge+in+Parks+Management:+A+Canadian+perspective#0>

- Dietz, T., Ostrom, E., and Stern, P. C. (2003). The struggle to govern the commons. *Science (New York, N.Y.)*, 302(5652), 1907–12. doi:10.1126/science.1091015
- Ditton, R., Holland, S., and Anderson, D. (2002). Recreational fishing as tourism. *Fisheries*, 17–24. Retrieved from  
[http://www.tandfonline.com/doi/abs/10.1577/1548-8446\(2002\)027<0017:RFAT>2.0.CO;2](http://www.tandfonline.com/doi/abs/10.1577/1548-8446(2002)027<0017:RFAT>2.0.CO;2)
- Dłuzewska A. M. (2019) Well-being versus sustainable development in tourism—The host perspective. *Sustainable Development*. 27:512–522. <https://doi.org/10.1002/sd.1903>
- Doxey, G. V. (1975), “Leisure, tourism and Canada’s aging population”, *Tourism in Canada: Selected issues and options*, P.E. Murphy, ed. Western Geographical Series 21, 57-72. Victoria, B.C.: University of Victoria.
- Doxey, G.V. (1975b.) A causation theory of visitor-resident irritants: Methodology and research inferences. In *Travel and Tourism Research Associations Sixth Annual Conference Proceedings* (pp. 195–98). San Diego, September.
- Eadington W. R., and Smith V.L., eds. 1992. *Tourism Alternatives: Potentials and Problems in the Development of Tourism*. Philadelphia: Univ. Penn. Press
- Easterling, D. (2004). The residents’ perspective in tourism research: a review and synthesis. *Journal of Travel & Tourism Marketing*, 17(4), 45e62.
- Eber, S. (1992) Beyond the Green Horizon: A Discussion Paper on Principles for Sustainable Tourism, Godalming: Worldwide fund for Nature.
- Edgell, D. L. and Swanson, J.R. (2013) *Tourism Policy and Planning: yesterday, today and tomorrow*. Second ed. Routledge Publishing, New York, NY. pp. 305.
- Ellis, S. C. (2005). Meaning Consideration ? A Review of Traditional Knowledge in Environmental Decision Making. *Arctic*. Volume 58, No. 1. pp. 66-77.
- Ellison, A.M., and Farnsworth, E.J. (1996) Anthropogenic disturbances of Caribbean mangrove ecosystems: past impacts, present trends and future predictions. *Biotropica*. 28 (4a.) 5490565.
- Elmer, L.K., Kelly, L.A., Rivest, S., Steell, S.C., Twardek, W.M., Danylichuk, A.J., Arlinghaus, R., Bennett, J.R., and Cooke, S.J. (2017) Angling into the Future: Ten Commandments for Recreational Fisheries Science, Management, and Stewardship in a good Anthropocene. *Environmental Management*, 60:165-175.

- Erhlich, P., and Erhlich, A. (1968) *The Population Bomb*, New York: Sierra Club.
- Erisman H. M. 1983. Tourism and cultural dependency in the West Indies. *Annals of Tourism Research*, 10:337–61
- ExumaPark.org (2017) <http://exumapark.org>. Accessed, June, 2017.
- Failing, L., Gregory, R., and Harstone, M. (2007). Integrating science and local knowledge in environmental risk management: A decision-focused approach. *Ecological Economics*, 64(1), 47–60. doi:10.1016/j.ecolecon.2007.03.010
- FAO. (2016). *Recreational fisheries economic impact assessment manual and its application in two study cases in the Caribbean: Martinique and The Bahamas* (Vol. 1128).
- FAO (2003) Fisheries Management, an ecosystem approach to fisheries. *FAO Technical Guidelines for Responsible Fisheries. No. 4, Suppl. 2*. Rome, Food and Agriculture Organization of the United Nations. 112 pgs.
- FAOUN. (2016) Fisheries and Aquaculture in The Bahamas: A Review. *Food and Agriculture Organization of the United Nations*. Department of Marine Resources Nassau, The Bahamas. Pp. 79.
- Fedler, T. (2010) *The Economic Impact of Flats Fishing in The Bahamas*. Report Prepared for The Bahamas Flats Fishing Alliance. 20pp.
- Fedler, A. J., and Ditton, R. B. (1986). The framework for understanding the consumptive orientation of recreational fishermen. *Environmental Management*, 10(2), 221–227.
- Feitosa, C. V., Chaves, L. C. T., Ferreira, B. P., ad De Araújo, M. E. (2012). Recreational fish feeding inside Brazilian MPAs: Impacts on reef fish community structure. *Journal of the Marine Biological Association of the United Kingdom*, 92(7), 1–9. <https://doi.org/10.1017/S002531541200013>.
- Fennell, D. A. (1999). *Ecotourism, an Introduction*. Routledge, London.
- Fennell, D. A. (2000). Comment : Ecotourism on Trial – The Case of Billfish Angling as Ecotourism. *Journal of Sustainable Tourism*, 8(4), 341–345.
- Fennell, D. A. (2001). A content analysis of ecotourism definitions. *Current Issues in Tourism*, 4, 403–421.
- Fennell, D. A. (2006). *Tourism Ethics* (1st ed.). North York, Ontario, Canada: Channel View Publications.

- Fennell, D. A. (2012). *Tourism and Animal Ethics*. (M. Hall, Ed.) (pp. 1– 305). New York, NY: Routledge.
- Fernandez-Gimenez, M. E., Huntington, H. P., and Frost, K. J. (2007). Integration or co-optation? Traditional knowledge and science in the Alaska Beluga Whale Committee. *Environmental Conservation*, 33(04), 306.  
doi:10.1017/S0376892906003420
- Fitzgerald, M. (2017) Personal Communication. Frontiers Travel.  
<http://www.frontierstravel.com/saltwater>
- Forbes, B. (1998) Curry County sustainable nature-based tourism project. In Hall, M. and Lew, A. (Eds.), *Sustainable Tourism: A Geographical Perspective*. (pp. 119-131), Essex, UK., Addison Wesley Longmann Limited.
- Flint, C. G., Robinson, E. S., Kellogg, J., Ferguson, G., Boufajreldin, L., Dolan, M., and Lila, M. A. (2011). Promoting wellness in Alaskan villages: integrating traditional knowledge and science of wild berries. *EcoHealth*, 8(2), 199–209.  
doi:10.1007/s10393-011-0707-9
- Ford, J. (2000). Traditional Ecological Knowledge, Ecosystem Science, and Environmental Management. *Ecological Society of America*.
- Frezza, P. E., and Clem, S. E. (2015). Using local fishers' knowledge to characterize historical trends in the Florida Bay bonefish population and fishery. *Environmental Biology of Fishes*, 98(11), 2187–2202. doi:10.1007/s10641-015-0442-0
- Franklin, A. (1999). *Animals and modern cultures: A sociology of human-animal relations in modernity*. London: Sage.
- Franklin, A. (2001). Neo-Darwinian leisure, the body and nature: Hunting and angling in modernity. *Body and Society*, 4(3), 57–76.
- Freire, K. M. F., Machado, M. L., & Crepaldi, D. (2012). Overview of Inland Recreational Fisheries in Brazil. *Fisheries*, 37(11), 484–494.  
doi:10.1080/03632415.2012.731867
- Freese, C. H. (1998). *Wild species as commodities: managing markets and ecosystems for sustainability*. Washington, DC: Island Press.
- Frost, W., and Hall, C.M. (2009) American invention to international concept: the spread and evolution of national parks, In W. Frost and C.M. Hall (eds.) *Tourism and National Parks: International Perspectives on Development, Histories and Change*, Routledge Publishing, London.

- Gallie, W.B. (1955-56) Essentially uncontested concepts, *Proceedings of the Aristotelian Society*, 56, 167-198.
- Garrod, B., and Wilson, J. C. (2003). *Marine Ecotourism, Issues and Experiences* (pp. 1– 262). Toronto, Ontario: Channel View Publications.
- Geertz, C. (1974) “From the native’s point of view”: On the nature of anthropological understanding. *Bulletin of the American Academy of Arts and Sciences*, 28(1), 26-45.
- GESAMP (Group of experts on the scientific aspects of marine environment protection). (1996). *Report of the task force on integrated coastal management*. Rome, Italy.
- Gibbs, G. R., Friese, S., and Mangabeira, W. C. (2002). The Use of New Technology in Qualitative Research. Introduction to Issue 3(2) of FQS. Forum: *Qualitative Social Research / Sozialforschung*, 3(2). Retrieved from: <http://www.qualitative-research.net/index.php/fqs/article/view/847/1840>
- Gibson, R. B. (2005). *Sustainability Assessment* (p. 248). London: Earthscan.
- Glaser, B.G. and Strauss, A.L. (1967) The discovery of grounded theory; strategies for qualitative research. Chicago, Aldine. Pp. 271.
- Glinton, O. (2014). *Personal communication*, Deep Water Cay, Grand Bahama Island.
- Godfrey, D. (2009) Sea Turtle Conservancy Media Resources: Press Release Archive, August, 28, 2009.. Sea Turtle Conservancy, <https://conserveturtles.org/10687-2/>. Accessed, May, 2017.
- Goldstein, B. (2007). “All Photos Lie: Images as Data,” In Stanczak, G. (ed.) *Visual Research Methods: Image, Society and Representation*. Thousand Oaks, California: Sage Publications. Pp. 61-82.
- Gómez-Baggethun, E., Mingorría, S., Reyes-García, V., Calvet, L., and Montes, C. (2010). Traditional ecological knowledge trends in the transition to a market economy: empirical study in the Doñana natural areas. *Conservation Biology : The Journal of the Society for Conservation Biology*, 24(3), 721–9. doi:10.1111/j.1523-1739.2009.01401.x
- Goodwin, H. (1996). In Pursuit of Ecotourism. *Biodiversity and Conservation*, 5, 277–291.
- Goodwin, H. (2016) *Responsible Tourism: Using tourism for sustainable development*. Goodfellow Publishers, Oxford, UK. pp. 268

- Gorg, H. (2000). Multinational companies and indirect employment: Measurement and evidence. *Applied Economics*, 32, 1809–1818.
- Gössling, S. (2002) Global environmental consequences of tourism. *Global Environmental Change*, 12:283-302.
- Gössling, S. (2003). *Tourism and Development in Tropical Islands* (pp. 1–283). Northampton, MA: Edward Elgar Publishing Inc.
- Gössling, S., and Hall, M. (eds.) (2006) *Tourism and Global Environmental Change*, Routledge Publishing, London.
- Gössling, S., Scott, D. ,and Hall, C.M. (2013) Challenges of tourism in a low-carbon economy, *WIREs Climate Change*, 4(6): 525-538. André, P., Enserink, B., Connor, D., & Croal, P. (2006). Public participation international best practice principles. *IAIA, Special Publication Series*, (4). Retrieved from <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Public+Participation:+International+Best+Practice+Principles#0>
- Green, R. J., and Higginbottom, K. (2001). Status assessment of wildlife tourism in Australia series: The negative effects of wildlife tourism on wildlife (*Wildlife Tourism Research*, Report No. 5). Gold Coast, Queensland, Australia: CRC for Sustainable Tourism.
- Greiner, R., Franklin, D., and Gregg, D. (2013). Towards an improved understanding of angler tourism in northern Australia. *Fisheries Management and ...*, 161–173. doi:10.1111/fme.12004
- Guindon, K. M. (2011) *Evaluating Lethal and Sub-Lethal Effects of Catch and Release Angling in Florida's Central Gulf Coast Recreational Atlantic Tarpon (Megalops atlanticus) Fishery*. Doctoral Dissertation, University of South Florida Department of Marine Sciences. Pp. 177.
- Haambiya, L., Kaunda, E., Likongwe, J., and Chama, L. (2015). Towards Effective Stakeholder Participation in Co- management through Fisheries Management Clinics, 2(6), 248–254.
- Hall, C.C (2001) Trends in ocean and coastal tourism: the end of the last frontier? *Ocean and Coastal Management*, Vol. 44, Iss. 9-10, 601-618.
- Hall, M. (1998) Historical antecedents of sustainable development and ecotourism: new labels old bottles?, In Hall, M. and Lew, A. (Eds.), *Sustainable Tourism: A Geographical Perspective*. (pp. 13- 24), Essex, UK., Addison Wesley Longmann Limited.
- Hall, C.M. (2010) Changing paradigms and global change: From sustainable to steady-state tourism. *Tourism Recreation Research*, 35(2): 131-145.

- Hall, G. B., and Close, C. H. (2007). Local knowledge assessment for a small-scale fishery using geographic information systems. *Fisheries Research*, 83(1), 11–22. doi:10.1016/j.fishres.2006.08.015
- Hall, M., and Lew, A. (1998) The geography of sustainable tourism development: an introduction, In Hall, M. and Lew, A. (Eds.), *Sustainable Tourism: A Geographical Perspective*. (pp. 1-13), Essex, UK., Addison Wesley Longmann Limited.
- Hall, C. M., Scott, D., and Gössling, S. (2013). The primacy of climate change for sustainable international tourism. *Sustainable Development*, 21(2), 112–121.
- Hall, M., Gössling, S., Scott, D., and Hall, M. (2015) The evolution of sustainable development and sustainable tourism. In *The Routledge Handbook of Tourism and Sustainability*, (eds.) Hall, M., Gössling, S., and Scott, M., Routledge Publishing, New York, NY. Pgs. 15-35.
- Hampton, M. P., and Jeyacheya, J. (2013). *Tourism and Inclusive Growth in Small Island Developing States*. London, UK: Commonwealth Secretariate, The World Bank.
- Hardiman, N., and Burgin, S. (2010). Recreational impacts on the fauna of Australian coastal marine ecosystems. *Journal of Environmental Management*, 91(11), 2096–2108. doi:10.1016/j.jenvman.2010.06.012
- Hardin, G. (1968). The tragedy of the commons. *Science*, 102, 1243–8.
- Hayes, M.C., Peterson, M.N., Heinen-Kay, J.L., and Langerhans, R.B. (2015) Tourism-related drivers of support for protection of fisheries resources on Andros Island, The Bahamas. *Ocean and Coastal Management*, 106:118-123.
- Heider, K.G. (1976) *Ethnographic Film*. University of Texas Press, 180 pgs.
- Herbst, D. F., and Hanazaki, N. (2014). Local ecological knowledge of fishers about the life cycle and temporal patterns in the migration of mullet ( *Mugil liza* ) in Southern Brazil. doi:10.1590/1982-0224-20130156
- Hertzer, N. D. (1965). Environments, Tourism, Culture, LINKS. *Ecosphere*, 1(2), 1–3.
- Higginbottom, K., Green, R., and Northrope, C. (2003) A framework for managing the negative impacts of wildlife tourism on wildlife. *Human Dimensions of Wildlife*. 8:1, pp.1-24
- Higgins, B. R. (1996). The global structure of the nature tourism industry: Eco-tourist, tour operators, and local businesses. *Journal of Travel Research*, 35(2), 11 – 18.



- Hightower, J. (2002) Campaign for a living wage, *Journal of Public Health Policy*, 23(3): 265-267.
- Hilborn, R (2007). "Managing fisheries is managing people: what has been learned?". *Fish and Fisheries*. 8 (4): 285–296. doi:10.1111/j.1467-2979.2007.00263.2.x.
- Hind, E. J. (2014a). A review of the past, the present, and the future of fishers' knowledge research: a challenge to established fisheries science. *ICES J. Mar. Sci.*, fsu169–. doi:10.1093/icesjms/fsu169
- Hind, E. J. (2014b). Knowledge research : a challenge to established fisheries science. *ICES Journal of Marine Science*.
- Hoehn, S., and Thapa, B. (2009). Attitudes and perceptions of indigenous fishermen towards marine resource management in Kuna Yala, Panama. *International Journal of Sustainable Development & World Ecology*, 16(6), 427–437. doi:10.1080/13504500903315938
- Hoeppe, G. (2007). *Conversations on the Beach: Fisherman's Knowledge, Metaphor and Environmental Change in South India*. New York, NY: Berghahn Books.
- Holland, S., Ditton, R., and Graefe, A. (1998). An ecotourism perspective on billfish fisheries. *Journal of Sustainable Tourism*, 6(2), 97–116. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/09669589808667305>
- Hughes, M., Pforr, C., and Weaver, D. (2015) Confronting the reality of paradox in sustainable tourism. In M. Hughes, D. Weaver and C. Pforr (Eds.) *The Practice of Sustainable Tourism*, (pp. 1-9) Routledge Publishing, New York, NY.
- Hunn, E. S., Johnson, D. R., Russell, P. N., and Thornton, T. F. (2003). Huna Tlingit Traditional Environmental Knowledge , Conservation , and the Management of a “ Wilderness ” Park. *Current Anthropology*, 44.
- Huntington, H.P. (1998). Observations on the utility of the semi-directive interview for documenting traditional ecological knowledge. *Arctic*, 51, 237-242.
- Huntington, H. P. (2000). Using Traditional Ecological Knowledge in Science: Methods and Applications. *Ecological Applications*, 10(5), 1270–1274.
- Huntington, H. P. (2011). The local perspective. *Nature*, 478(Oct.), 7–8.
- Hvenegaard, G. T. (1994). Ecotourism: a status report and conceptual framework. *Journal of Tourism Studies*, 5(2), 24–35.
- IISD (2017) International Institute for Sustainable Development. <http://www.iisd.org/topic/sustainable-development>. Accessed, June, 2017.

- IMO. (2017) International Maritime Organization.  
<http://www.imo.org/en/Pages/Default.aspx>. Accessed, June, 2017.
- IUCN. (1991). *Guidelines for Establishing Marine Protected Areas*. Gland, Switzerland.
- Jacob, M. (1994) Toward a methodological critique of sustainable development, *Journal of Developing Areas* 28, 237-252.
- Jafari J. 2001. Research and scholarship: the basis of tourism education. *Journal of Tourism Studies*, 1:33– 41.
- Jennings, S. (2004) Coastal tourism and shoreline management. *Annals of Tourism Research*. Vol. 31, Iss. 4. 899-922.
- Jentoft, S. (2004). "Fisheries co-management as empowerment". *Marine Policy*. **29**: 1–7. doi:10.1016/j.marpol.2004.01.003.
- Johnson, H. (1989). The Emergence of Peasantry in the Bahamas during Slavery. *Slavery and Abolition*, 10(2), 180–183.
- Johnson, H. (1996). *The Bahamas from Slavery to Servitude, 1783-1933* (p. 235). Gainesville, Florida: University Press of Florida.
- Johnson, J.D., and Snepenger, D.J. (1994), “Resident’s perceptions of tourism development”, *Annals of Tourism Research*, 21(3) 629-642.
- Johnson, M. (1992). *Lore, Capturing Traditional Environmental Knowledge*. (M. Johnson, Ed.) (pp. 1– 190). Hay River, N.W.T: Dene Cultural Institute.
- Johannes, R.E., and Neis, B. (2007). The Value of Anecdote. In I. G. Haggan, N., Neis, B., and Baird (Ed.), *Fishers Knowledge in Fisheries Science and Management* (pp. 41–59). Paris, France: United Nations Educational, Scientific and Cultural Organization.
- Johannes, R. (2000). Ignore fishers’ knowledge and miss the boat. *Fish and Fisheries*, (1984), 257–271. Retrieved from  
<http://onlinelibrary.wiley.com/doi/10.1111/j.1467-2979.2000.00019.x/full>
- Kalanda-Sabola, M.D., Henry, E.M.T., Kayambazinho, E., and Wilson, J. (2007). Use of indigenous knowledge and traditional practices in fisheries management : a case of Chisi Island , Lake Chilwa , Zomba. *Malawi Journal of Sci and Techn.*, 8 (December), 9–29.
- Karrow, T., and Thompson, T. (2016) The Political Ecology of the Bahamian Flats Fishing Industry, In *Political Ecology and Tourism*, Rutledge Publishing, ed. Sanjay Nepal and Jarkko Saarinen. Chapter 2.

- Karrow, T. (n.d.) Ghost Stories, A History of Recreational Flats Fishing in The Bahamas; through the eyes of the guides.
- Kayat, K. (2002), "Power, social exchanges and tourism in Langkawi: Rethinking resident perceptions", *International Journal of Tourism Research*, 4, 171-191.
- Kensit, D. (2000). Rogerian theory: a critique of the effectiveness of pure client centre therapy. *Counseling Psychology Quarterly*, 13(4), 335e342.
- Kindon, S. L. (2003). Participatory video in geographic research: A feminist practice of looking? *Area*, 35(2), 142–153.
- Krippendorff, J. (1987) *The Holiday Makers*. Redwood Burn Ltd. Trowbridge, Wiltshire. pp. 160.
- Kroloff, E.K.N. (2016) Where are all the Bonefish? Using Angler perceptions to estimate trends of Bonefish (*Albula vulpes*) Decline in South Florida. Masters Thesis, Florida International University, Miami, Florida. Pp 34.
- Laarman, J. and Durst, P. (1987). Nature travel in the tropics. *Journal of Forestry*. *Journal of Forestry*, 5, 43–46.
- Laffoley, D.D'A., Maltby, E., Vincent, M.A., Mee, L., Dunn, E., Gilliland, P., Hamer, J.P., Mortimer, D., and Pound, D. (2004). *The Ecosystem Approach. Coherent Actions for Marine and Coastal Environments*. Peterborough, UK.
- Larkin, M. (2011) *Assessment of south Florida's bonefish stock*. University of Miami, Department of Marine Biology and Fisheries. Doctoral Dissertation, pp. 213
- Larkin, M.F., Ault, J.S., Humston, R., and Luo, J. (2010) A mail survey to estimate the fishery dynamics of southern Florida's bonefish charter fleet. *Fisheries Management and Ecology*. Vol. 17:3 pp. 254-261. <https://doi.org/10.1111/j.1365-2400.2009.00718.x>
- Lauer, M., and Aswani, S. (2010). Indigenous knowledge and long-term ecological change: detection, interpretation, and responses to changing ecological conditions in Pacific Island communities. *Environmental Management*, 45(5), 985–97. doi:10.1007/s00267-010-9471-9
- Lawson, R., Williams, J., Young, T., and Cossens, J. (1998). A comparison of residents' attitudes towards tourism in 10 New Zealand destinations. *Tourism Management*, 19(3), 247e256
- Leadon, S. (2014) Personal Communication. Andros Island Bonefish Club, Bering Point, Andros Island, Bahamas. <http://www.androsbonefishing.com>. Accessed, October, 2015.

- Lemelin, H., Dampier, E. E., Makin, D., and Cross, J. (2014). Aboriginal erasure or aboriginal historical exclusion? Using video interviews to recognize the role of aboriginal peoples on Kitchi-Gami (Lake Superior) *The Journal of Rural and Community Development*, 9(3), 176–185.
- Léopold, M., Herrenschmidt, J., and Thaman, R. (2008). The Relevance of Traditional Ecological Knowledge for Modern Management of Coral Reef Fisheries in Melanesia. *Proceedings of the 11th International Coral Reef Symposium, Ft.Lauderdale, Fl.*, (22), 7–11.
- Lertzman, D. A. (2010). Best of two worlds : and Western science in ecosystem- based management. *BC Journal of Ecosystems and Management*, 10(3), 104–126.
- Liu, C. H., Tzeng, G. H., Lee, M. H., and Lee, P. Y. (2013). Improving metro–airport connection service for tourism development: Using hybrid MCDM models. *Tourism Management Perspectives*, 6, 95–107.
- Lowrey, A. (2019) Too Many People Want to Travel: Massive crowds are causing environmental degradation, dangerous conditions and the immiseration of pricing-out locals. *The Atlantic Monthly*, June 4, 2019 Accessed, June, 2019. Available at <https://www.theatlantic.com/ideas/archive/2019/06/crowds-tourists-are-ruining-popular-destinations/590767/>
- Lovelock, B., and Lemelin, R. H. (2008). Tourism and the Consumption of Wildlife : Hunting , Shooting , and Sport Fishing Culture on Tour : Ethnographies of Travel. *Annals of Tourism Research*, 35, 842–843. doi:10.1016/j.annals.2008.03.006
- Lovelock, B. (2015) Consumptive and non consumptive tourism practices. In *The Routledge Handbook of Tourism and Sustainability*, (eds.) Hall, M., Gössling, S., and Scott, M., Routledge Publishing, New York, NY. Pgs. 165-174.
- Lu, J., and Nepal, S. K. (2009). Sustainable tourism research: an analysis of papers published in the Journal of Sustainable Tourism. *Journal of Sustainable Tourism*, 17(1), 5–16. doi:10.1080/09669580802582480
- Lück, M. (2008). *The Encyclopedia of Tourism and Recreation in Marine Environments*. (M. Luck, Ed.) (p. 880). Cambridge, MA: CABI Publishing.
- MacCannell, D. (1973) Staged Authenticity: Arrangements of Social Space in Tourist Settings. *The American Journal of Sociology*, Vol. 79, No. 3., 589-603
- MacCannell, D. (2002). Reflections and Reviews The Ego Factor in Tourism. *Journal of Consumer Research*, 29.
- Mac Leod, P, HLA Consultants, A. (2010). *Andros Economic Development Plan - Becoming the Bahamas' Premier Ecotourism Destination*.

- Mahon, R. and McConney, P. (2004). "Managing the managers: improving the structure and operation of small fisheries departments, especially in SIDS". *Ocean and Coastal Management*. 47 (9–10): 529–535.  
doi:10.1016/j.ocecoaman.2004.09.001.
- Malinoswki, B. (1922). *Argonauts of the Western Pacific*. Routledge and Keegan Paul Publishers, New York. 527 pgs.
- Mansperger, M. C. 1995. Tourism and cultural change in small-scale societies. *Human Organization*, 54:87–94
- Marsh, G. P, (1965) *Man and Nature; or Physical Geography as Modified by Human Action*, orig. 1864, ed. D. Lowenthal, Cambridge: The Belknap Press of Harvard University Press.
- Martin, B., McGuire, F., and Allen, L. (1998), “Retirees’ attitudes toward tourism: Implications for sustainable development”, *Tourism Analysis*, 3: 43-51.
- Mason, L., White, G., Morishima, G., Alvarado, E., Andrew, L., Clark, F., and Wilder, S. (2012). Listening and Learning from Traditional Knowledge and Western Science : A Dialogue on Contemporary Challenges of Forest Health and Wildfire. *Journal of Forestry*, (June), 187–193.
- Matlock G.C., Saul, G.E. and Bryan, D. E. (1988). Importance a fish consumption to sports fishermen. *Fisheries*, 12, 25–26.
- Mauro, F., and Hardison, P. D. (2000). Traditional Knowledge of Indigenous and Local Communities: international Debate and Policy Initiatives. *Ecological Applications*, 10(October), 1263–1269.
- Maxwell, J. A. (2005) *Qualitative Research Design: an interactive approach*. 2<sup>nd</sup> ed. Sage Publications. Pp. 174.
- McDonald, M. (1988). *Traditional Knowledge, Adaptive Management and Advances in Scientific Understanding*. (Freeman and Carbyn, Ed.) (pp. 65–71).
- McElroy, J.L. & de Albuquerque, K. (2002). Problems for managing sustainable tourism in small islands. In: Y. Apostolopoulos, and D.J. Gayls (Eds.). *Island tourism and sustainable development: Caribbean, Pacific and Mediterranean Experiences* (pp. 15-34). Westport, CT: Praeger.
- McLaren D. 1997. *Rethinking Tourism and Ecotourism: The Paving of Paradise and What You Can Do to Stop It*. West Hartford, CN: Kumarian

- Menzies, C. R. E. (2006). *Traditional Ecological Knowledge and Cultural Resource Management*. (C. Menzies, C. R. and Butler, Ed.) (pp. 1–270). Lincoln and London: University of Nebraska Press.
- Merriam, S. B. (1991). How Research Produces Knowledge. In J. M. Peters & P. Jarvis (Eds.), *Adult Education* (p. 42-65). Lanham, MD: Jossey-Bass.
- Milne, S.S. (1998) Tourism and sustainable development: the global-local nexus. In Hall, M. and Lew, A. (Eds.), *Sustainable Tourism: A Geographical Perspective*. (pp. 35-48), Essex, UK., Addison Wesley Longmann Limited.
- Moller, H., Berkes, F., Lyver, P.O., and Kislalioglu, M. (2004). Combining science and traditional ecological knowledge: monitoring populations for co-management. *Ecology and Society*, 9(3).
- Moscardo, G., Pearce, P., Green, D., and O’Leary, J.T. (2001) Understanding coastal and marine tourism demand from three European markets: implications for the future of ecotourism. *Journal of Sustainable Tourism*, 9(3), 212-227.
- Mossaz, A., Buckley, R.C., and Castley, J.G. (2015) Ecotourism contributions to conservation of African big cats. *Journal for Nature Conservation*. 28, 112-118.
- Murchie, K., Shultz, A., Stein, J., Cooke, S., Lewis, J., Franklin, J., Vincent, G., Brooks, E., Claussen, J., and Phillip, D. (2015) Defining adult bonefish (*Albula vulpes*) movement corridors around Grand Bahama in the Bahamian archipelago. *Environmental Biology of Fishes*. Vol. 98(11), pp. 2203-2212.
- Murchie, K. (2010) Physiological ecology and behaviour of bonefish (*Albula vulpes*) in tropical tidal flats ecosystems. Doctoral dissertation, Carleton University, Ottawa, Ontario, Canada. pp. 244.
- Murray, C. (2011). *Incorporation of traditional and local ecological knowledge and values in fisheries management Incorporation of Traditional and Local Ecological Knowledge and Values in Fisheries Management*.
- Nadasdy, P. (2013). The Politics of TEK : and “ Integration ” of Knowledge, 36(1), 1–18.
- Nash D. 1981. Tourism as an anthropological subject. *Current Anthropology*, 22:461–81
- Nassau Guardian (2017) Major Hurricanes to hit The Bahamas.  
[http://www.thenassauguardian.com/index.php?option=com\\_content&view=article&id=40272:major-hurricanes-to-hit-the-bahamas&catid=84:hurricane](http://www.thenassauguardian.com/index.php?option=com_content&view=article&id=40272:major-hurricanes-to-hit-the-bahamas&catid=84:hurricane).  
 Accessed, May, 2017.

- Naughton-Treves, L., Holland, M. B., and Brandon, K. (2005). the Role of Protected Areas in Conserving Biodiversity and Sustaining Local Livelihoods. *Annual Review of Environment and Resources*, 30(1), 219–252. doi:10.1146/annurev.energy.30.050504.164507
- Neis, B., Schneider, D. C., Felt, L., Haedrich, R. L., Fischer, J., and Hutchings, J. A. (1999). Fisheries assessment : what can be learned from interviewing resource users ? *Canadian Journal of Fisheries and Aquatic Science*, 56, 1949–1963.
- Nepal, S., Verkoeyen, S., and Karrow, T. (2015) The end of sustainable tourism? Re-orienting the debate. In M. Hughes, D. Weaver and C. Pforr (Eds.) *The Practice of Sustainable Tourism*, (pp. 52-65) Routledge Publishing, New York, NY.
- Newsome, D., Moore, S., and Dowling, R. K. (2002). *Natural Area Tourism: Ecology, Impacts and Management*. Clevedon: Channel View.
- Noble, B. F. (2010). *Introduction to Environmental Impact Assessment, A Guide to Principles and Practices* (2nd Ed., p. 272). Don Mills, Ontario: Oxford University Press.
- Normann, O. (2008). Green fishing tourism in Lofoten, Northern Norway. In B. Lovelock (Ed.), *Tourism and Consumption of Wildlife: Hunting, Shooting and Sportfishing* (pp. 45–58). New York, NY: Routledge.
- Oh, C.O., and Ditton, R. B. (2006). Using recreational specialization to understand multi attribute management preferences. *Leisure Sciences*, 28, 369–384.
- Olsson, P., and Folke, C. (2001). Local Ecological Knowledge and Institutional Dynamics for Ecosystem Management : A Study of Lake Racken Watershed , Sweden, 85–104. doi:10.1007/s100210000061
- Olindo, P. (1991). The old man of nature tourism: Kenya. In T. Whelan (Ed.), *Nature Tourism: Managing for the Environment*. Washington, D.C.: Island Press.
- Orams, M. (1995). Towards a more desirable form of ecotourism. *Tourism Management*. Retrieved from <http://www.sciencedirect.com/science/article/pii/026151779400001Q>
- Orams, M. B. (1999). *Marine Tourism: Development, Impacts and Management*. London, UK: Routledge.
- O'Meara, N. (2015) Environmental Multiplicity in The Bahamas: Situating Traditional Ecological Knowledge and Conservation Ethics in Cultural Landscapes. Masters Thesis, University of Northern Arizona, Department of Anthropology. Pp.136

- O'Reilly, A.M. (1993) Tourism in the Bahamas – an appraisal. In, *Tourism Marketing and Management in the Caribbean*. Eds. Gayle, D.J. and Goodrich, J. N. Routledge Publishing, New York, NY. Chapter 3, pgs. 31- 40.
- O'Toole, A.C., Danylchuk, A.J., Suski, C.D., and Cooke, S. J. (2010). Consequences of catch-and-release angling on the physiological status, injury, and immediate mortality of great barracuda (*Sphyraena barracuda*) in The Bahamas. *ICES Journal of ...* Retrieved from <http://icesjms.oxfordjournals.org/content/early/2010/07/28/icesjms.fsq090.short>
- Page, S., and Thorn, K. (1998) Sustainable tourism development and planning in New Zealand: local government responses. In Hall, M. and Lew, A. (Eds.), *Sustainable Tourism: A Geographical Perspective*. (pp. 173-184), Essex, UK., Addison Wesley Longmann Limited
- Patroni, J., Simpson, G., and Newsome, D. (2017) Feeding wild fish for tourism-A systematic quantitative literature review of impacts and management. *International Journal of Res.* 2018;20:286-298. <https://doi.org/10.1002/jtr.2180>
- Patterson, T. & Rodriguez, L. (2003). The political ecology of tourism in the Commonwealth of Dominica. In, S. Gossling (Ed.). *Tourism and development in tropical islands* (pp. 60–87). Northhampton, MA: Edward Elgar Publishing Inc.
- Pauly, D. (1995) Anecdotes and the shifting baseline syndrome of fisheries. *Trends in Ecology and Evolution*, Volume 19, October 1995. Pp. 430
- Payscale (2018) <https://www.payscale.com/research/BS/Location=Nassau/Salary>. Accessed, February, 2018.
- Pearce, P. L., Moscardo, G., and Ross, G.F., (1991), “Tourism impact and community perception: An equity-social representational perspective”, *Australian Psychologist*, 26(3) 147-152.
- Pearce, D.G. (2000) Tourism plan reviews: methodological considerations and issues from Samoa. *Tourism Management*, 24(1), 191-203.
- Pederson, J., and Hall-Arber, M. (1999). Fish habitat: a focus on New England fishermen's perspectives. In L. R. Benaka (Ed.), *Fish Habitat: Essential Fish Habitat and Rehabilitation*. (pp. 188–211). American Fisheries Society, Bethesda, MD.
- Pforr, C. (2015) Tourism publicpolicy in pursuit of sustainability: Discrepancies between rhetoric and reality. . In M. Hughes, D. Weaver and C. Pforr (Eds.) *The Practice of Sustainable Tourism*, (pp. 24- 37) Routledge Publishing, New York, NY.



- Phillipson, J., and Symes, D. (2013). Science for sustainable fisheries management: An interdisciplinary approach. *Fisheries Research*, 139, 61–64.  
doi:10.1016/j.fishres.2012.09.012
- Phuthago, T., and Chanda, R. (2004). Traditional ecological knowledge and community-based natural resource management: lessons from a Botswana wildlife management area. *Applied Geography*, 24(1), 57–76.  
doi:10.1016/j.apgeog.2003.10.001
- Pierotti, R. (2011). *Indigenous Knowledge, Ecology and Evolutionary Biology* (pp. 1–264). New York: Routledge, Taylor and Francis Group.
- Pierotti, R., and Wildcat, D. (2000). Traditional Ecological Knowledge: The Third Alternative. *Ecological Applications*, 10(January 1998), 1333–1340.
- Pink, S. (2013). *Doing Visual Ethnography*, 3<sup>rd</sup> ed. Sage Publishing, Washington D.C. pgs. 248.
- Pinkerton, E. (1990). *The Future of Traditional Ecological Knowledge and Resource Management in Native Communities*. Hull, Quebec.
- Pomeroy, R.S. 1995. Community-based and co-management institutions for sustainable coastal fisheries management in Southeast Asia. *Ocean and Coastal Management* Vol. 27, No. 3, pp. 143-162.
- Poon, A. 1993. *Tourism, Technology, and Competitive Strategies*. Harmondsworth, UK: CAB International.
- Pretty, J. (1995). The many interpretations of participation. *In Focus*, 16, 4–5.
- Prosser, J. (2012). Visual methodology: Toward a more seeing research. In N. Denzin & Y. Lincoln(Eds.), *The Sage Handbook of Qualitative Research* (4th ed) (pp.479-495). Los Angeles, CA: Sage.
- Ram, Y., Nawijin, J., and Peters, P.M. (2013) Happiness and limits to sustainable tourism mobility: A new conceptual model, *Journal of Sustainable Tourism*, 21(7): 1017-1035.
- Rasalato, E., Maginnity, V., and Brunnschweiler, J. M. (2010). Using local ecological knowledge to identify shark river habitats in Fiji (South Pacific). *Environmental Conservation*, 37(01), 90–97. doi:10.1017/S0376892910000317
- Redclift, M. (1987) *Sustainable Development: Exploring the Contradictions*, Methuen, London.
- Reed, M. S., Fazey, I., Stringer, L. C., Raymond, C. M., Akhtar-Schuster, M., Begni, G., and Wagner, L. (2011). Knowledge Management for Land Degradation

Monitoring and Assessment: an Analysis of Contemporary Thinking. *Land Degradation & Development*, n/a–n/a. doi:10.1002/ldr.1124

- Rehage, J., Santos, R.O., Kroloff, E.K.N., Heinen, J. T, Lai, Q., Black, B.D., Boucek, R.E., and Adams, A.J. (2018) How has the quality of bonefishing changed over the past 40 years? Using local ecological knowledge to quantitatively inform population declines in the South Florida flats fishery. *Environmental Biology of Fishes*, DOI: 10.1007/s10641-018-0831-2
- Restless, H. (2015) Tourism and common pool resources. In *The Routledge Handbook of Tourism and Sustainability*, (eds.) Hall, M., Gössling, S., and Scott, M., Routledge Publishing, New York, NY. Pgs. 92-104.
- Ritchie, J. R. B. (1993), “Crafting a destination vision: putting the concept of resident responsive tourism into practice”, *Tourism Management*, (Oct) 379-389.
- Robbens, Antonius C.G.M. (2007). "Sensorial Fieldwork." In *Ethnographic Fieldwork: An Anthropological Reader*, eds. Antonius C.G.M. Robbens and Jeffrey A. Suka. Malden: Blackwell Publishing, pgs. 385.
- Romeril, M. (1985) ‘Tourism and the environment – towards a symbiotic relationship’, *International Journal of Environmental Studies*, Vol. 25. pp. 215–18.
- Rolle, C. (2014). *Personal communication*, Bonefish Folley Guiding, West End, Grand Bahama Island
- Rolle, S.A. (2015) The Bahamas: Individual Island Branding for Competitiveness in Archipelago Tourism, in *Archipelago Tourism: Policies and Practices*, Chapter 9. Routledge Pub. Pp.163.
- Rose G. (2001). *Visual Methodologies: An Introduction to the Interpretation of Visual Materials*. London, United Kingdom: Sage.
- Rossel P. 1988. *Tourism: Manufacturing the Exotic*. Copenhagen: IWGIA
- Ross, S., and Wall, G. (1999). Ecotourism: towards congruence between theory and practice. *Tourism Management*, 20(1), 123–132. doi:10.1016/S0261-5177(98)00098-3
- Rutty, M., Gössling, S., Scott, D., and Hall, M. (2015) The global effects and impacts of tourism: An overview. In *The Routledge Handbook of Tourism and Sustainability*, (eds.) Hall, M., Gössling, S., and Scott, M., Routledge Publishing, New York, NY. Pgs. 36-63.
- Ryan, C. (2004). Marine Ecotourism: issues and Experiences, a Review. *Tourism Management*, 25, 525–527. doi:10.1016/S0261-5177(03)00129-8

- Santos, R.O., Rehade, J.S., Kroloff, E.K.N. Heinen, J.E., and Adams, A.J. (2018) Combining data sources to elucidate spatial patterns in recreational catch and effort: fisheries-dependent data and local ecological knowledge applied to the South Florida bonefish fishery. *Environmental Biology of Fishes*, Vol 102:2. pp. 299-317 <https://doi.org/10.1007/s10641-018-0828-x>
- Santos, R.O., Rehage, J.S., Adams, A.J., Black, B.D., Osborne, J., and Kroloff, E.K.N. (2017) Quantitative assessment of a data-limited recreational bonefish fishery using a time-series of fishing guides reports. *PLoS ONE*, Vol. 12(9), p.e0184776
- Saunders, A. (2000) History of Bimini, Volume 1. New World Press, Alice Town, Bimini. Pp. 195.
- Saunders, A. (2006) History of Bimini, Volume 2. New World Press, Alice Town, Bimini. Pp. 259.
- Saunders, G. (1991). *Aspects of Bahamian History, Loyalists, Slavery and Emancipation, Junkanoo* (p. 44). Nassau, Bahamas: Department of Archives, Ministry of Education.
- Saunders, G. (2000) The Bahamas, A Family of Islands. MacMillan Publishing Ltd., Malaysia. Pp. 201.
- Scape, R.C., Grifone, E., and Usher, R. (1992). *Ecotourism in Canada*. Hull, Quebec: Canadian Environmental Advisory Council.
- Scheyvens, R. (1999) Ecotourism and the empowerment of local communities. *Tourism Management*, 20. 245-249.
- Schleicher, J., Schaafsma, M., Burgess, N. D., Sandbrook, C., Danks, F., Cowie, C., and Vira, B. (2018). Poorer without it? The neglected role of the natural environment in poverty and wellbeing. *Sustainable Development*, 26(1), 83–98.
- Sealey, N.E. (2006) *Bahamian Landscapes*. 3<sup>rd</sup> Ed. MacMillan Education, Malaysia (pp. 172).
- Seetanah, B. (2011). Assessing the dynamic economic impact of tourism for island economies. *Annals of Tourism Research*, 38(1), 291–308. doi:10.1016/j.annals.2010.08.009
- Seiler-Baldinger A. 1988. Tourism in the Upper Amazon and its effects on the indigenous population. In *Tourism: Manufacturing the Exotic*, ed. P. Rossel, pp. 177–93. Copenhagen.
- Semeniuk, C.D.D., Haider, W., Cooper, A., and Rothley, K.D. (2010) A linked model

- of animal ecology and human behavior for the management of wildlife tourism. *Ecological Modeling*. 221, pp. 2699-2713.
- Sharpley, R. (2014) Host Perceptions of tourism: A review of the research. *Tourism Management*, 42(37-49).
- Shopes, L. (2011). Oral History. In Y. S. Denzin, N.K. and Lincoln (Ed.), *The Sage Handbook of Qualitative Research* (pp. 451– 466). Thousand Oaks, California: Sage Publications Inc.
- Shultz, A.D., Murchie, K.J., Griffith, C., Cooke, S.J. Danylchuk, A.J. Goldberg, T.L., and Suski, C.D. (2011) Impacts of dissolved oxygen on the behaviour of physiology of bonefish: Implications for live-release angling tournaments. *Journal of Experimental Marine Biology and Ecology*. Vol. 402(1), pp 19-26.
- Sigler, W. F., and Sigler, J. W. (1984). *Recreational fisheries: Management, theory, and application*. Reno and Las Vegas, Nevada: University of Nevada Press.
- Silvy, E. H., Peterson, M.N., Heinen-Kay, J. L., and Langerhans, R.B. (2018) Illegal harvest of marine resources on Andros Island and the legacy of colonial governance. *The British Journal of Criminology*, Vol. 58, Issue 2. Pp. 332-350.
- Sinelli, P.T. (2010). *All islands great and small: The role of Small Cay environments in indigenous settlement strategies in the Turks and Caicos Islands*. PhD. dissertation. Department of Anthropology, University of Florida, Gainesville, Florida.
- Smith, N., and D. Zeller. (2013). *Bahamas catch reconstruction: Fisheries trends in a tourism-drive economy (1950 – 2010)*. Working Paper #2013 – 08. Vancouver: University of British Columbia.
- Smith, P. (2013). *Personal communication*. Bahamas Fly Fishing Industry Association, [www.bffia.org](http://www.bffia.org). accessed Sept. 2013
- Snaith, T., and Haley, A. (1999). Residents' opinions of tourism development in the historical city of York. *Tourism Management*, 20(5), 595e603.
- Southwick, R., Maycock, D., and Bouaziz, M. (2016) Economic Impact of Recreational Fishing Tourism in The Bahamas. Recreational Fisheries Economic Impact Assessmnt manual and its Application in Two Study Cases in the Caribbean: Martinique and The Bahamas. Food and Agricutlre Organization of the United Nations. Bridgetown, Barbados. Circular n. 1128.
- Spradley, J.O. (1979). *The Ethnographic Interview*. Holt, Rinehart and Winston, Toronto. vii, 247 p.

- Stein, J., Shultz, A., and Cooke, S. (2012). The influence of hook size, type, and location on hook retention and survival of angled bonefish ( *Albula vulpes*). *Fisheries ...*, 113(1), 147–152. doi:10.1016/j.fishres.2011.11.001
- Stevenson, M. (2005). *Traditional Knowledge and Sustainable Forest Management*. Edmonton, Alberta.
- Stoffle, R., and Minnis, J. (2007). Marine protected areas and the coral reefs of traditional settlements in the Exumas, Bahamas. *Coral Reefs*, 26(4), 1023–1032. doi:10.1007/s00338-007-0264-4.
- Stonich, S. C. (1998). Political ecology of tourism. *Annals of Tourism Research*, 25(1), 25–54.
- Strachan, I. G. (2002) *Paradise and Plantation: Tourism and Culture in the Anglophone Caribbean*. University of Virginia Press, London. Pp 311.
- Strauss, A.L., and Corbin, J.M. (1990) *Basics of qualitative research; grounded theory procedures and techniques*. Newbury Park, CA. Sage Publications. Pp. 270.
- Stronza, A. (2001) *Anthropology of Tourism: Forging New Ground for Ecotourism and Other Alternatives*. *Annual Review of Anthropology*, Volume 30, pp. 261-283
- Suski, C. D., Cooke, S. J., Danylchuk, A. J., Connor, C. M. O., Gravel, M., Redpath, T., and Goldberg, T. L. (2007). Physiological disturbance and recovery dynamics of bonefish ( *Albula vulpes* ), a tropical marine fish , in response to variable exercise and exposure to air. *Comparative Biochemistry and Physiology*, 148, 664–673. doi:10.1016/j.cbpa.2007.08.018
- Szekeres, P., Brownscombe, J.W., Cull, F., Danylchuk, A.J., Schultz, A.D., Suski, C.D., Murchie, K.J., and Cooke, S. (2014) Physiological and behavioural consequences of cold shock on bonefish (*Albula vulpes*) in The Bahamas. *Journal of Experimental Marine Biology and Ecology*. Vol. 459. Pp. 1-7
- Sutton, S. G., and Ditton, R. B. (2005). The Substitutability of One Type of Fishing for Another. *North American Journal of Fisheries Management*, 25(2), 536–546. doi:10.1577/M04-059.1
- Sutinen, J. G., and Johnston, R. J. (2003). Angling management organizations: integrating the recreational sector into fishery management. *Marine Policy*, 27(6), 471–487. doi:10.1016/S0308-597X(03)00079-4
- Swain M. B. 1995. Gender in tourism. *Annals of Tourism Research*, 22:247–66.
- Tate, S. (2014). *Personal communication*, Deep Water Cay, Grand Bahamas Island.

- Teixeira, J. B., Martins, A. S., Pinheiro, H. T., Secchin, N. A., Leão de Moura, R., and Bastos, A. C. (2013). Traditional Ecological Knowledge and the mapping of benthic marine habitats. *Journal of Environmental Management*, 115, 241–50. doi:10.1016/j.jenvman.2012.11.020
- Tesfamichael, D., Pitcher, T. J., and Pauly, D. (2014). Assessing Changes in Fisheries Using Fishers' Knowledge to Generate Long Time Series of Catch Rates : a Case Study from the Red Sea. *Ecology and Society*, 19(1), 18. doi:10.5751/ES-06151-190118
- Thompson, T. (2016) Personal Communication. College of the Bahamas, Department of Public History and Oral Tradition. Nassau, Bahamas.
- Thornton, T., and Scheer, A. (2012). Collaborative Engagement of Local and Traditional Knowledge and Science in Marine Environments: A Review. *Ecology and Society*, 17(3). Retrieved from <http://www.ecologyandsociety.org/vol17/iss3/art8/ES-2012-4714.pdf>
- TIES (1990) The International Ecotourism Society, <http://www.ecotourism.org/what-is-ecotourism>.
- TIES (2015) The International Ecotourism Society, <http://www.ecotourism.org/what-is-ecotourism>.
- Trade Economics (2018) <https://tradingeconomics.com/bahamas/unemployment-rate>. Accessed Feb. 2018.
- Trant, A., Jacobs, J., and Sable, T. (2012). Teaching and learning about climate change with Innu Environmental Guardians. *Polar Geography*, 35(Sept. De.), 229–244. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/1088937X.2012.682229>
- Tribune (2017) New Cruise Port Announced for Grand Bahama, Tribune 242, <http://www.tribune242.com/news/2017/mar/10/new-cruise-port-announced-east-grand-bahama/>. Accessed, April, 2017.
- Thorstad, E. B., Hay, C. J., Næsje, T. F., Chanda, B., and Økland, F. (2004). Effects of catch-and-release angling on large cichlids in the subtropical Zambezi River. *Fisheries Research*, 69, 141–144. doi:10.1016/j.fishres.2004.04.005
- Truong, D. (2015) Pro-poor tourism: Reflections on past research and directions for the future. In *The Routledge Handbook of Tourism and Sustainability*, (eds.) Hall, M., Gössling, S., and Scott, M., Routledge Publishing, New York, NY. Pgs. 36–63.
- Tsuji, L., and Ho, E. (2002). Traditional environmental knowledge and western science: in search of common ground. *Canadian Journal of Native Studies*, 22(XII), 327–

360. Retrieved from  
[http://loki3.brandonu.ca/Library/cjns/22.2/cjnsv.22no.2\\_pg327-360.pdf](http://loki3.brandonu.ca/Library/cjns/22.2/cjnsv.22no.2_pg327-360.pdf)
- Tucker, R., McCoy, W., and Evans, E. (1990). Can questionnaires objectively assess organizational culture? *Journal of Managerial Psychology*, 5, 4e11.
- Turner, N.J., Ignace, M.B., and Ignace, R. (2000). Traditional Ecological Knowledge and Wisdom of Aboriginal Peoples on British Columbia. *Ecological Applications*, 10(October), 1275–1287.
- Turrell, T. T. (2016) A History of The Bahamas through maps. Coastal Publishing, Naples, Florida. pp.140
- The World Factbook 2013-14 (WFB). Washington, DC: Central Intelligence Agency, 2013 . <https://www.cia.gov/library/publications/the-world-factbook/index.html>
- United Nations World Tourism Organization (2018) Tourism Highlights, 2018 Edition. Available at: <https://www.e-unwto.org/doi/pdf/10.18111/9789284419876> (accessed, January, 2019).
- United Nations World Tourism Organization (2014) Sustainable Development of Tourism, Online. Available at: <http://sdt.unwot.org/content/anout-us-5> (accessed March 2017).
- United Nations World Tourism Organization (UNWTO) (2016) *Tourism, an economic and social phenomenon*. Retrieved, Feb. 2017 - <http://cf.cdn.unwto.org/content/why-tourism>
- Usher, P. J. (2000). Traditional ecological knowledge in environmental assessment and management. *Arctic*, 2, 183. Retrieved from <http://www.jstor.org/stable/10.2307/40512207>
- Valentine, P. (1992). "Nature-Based Tourism." In B. Hall, C.M., and Weiler (Ed.), *Special Interest Tourism* (pp. 105–127). London, UK: Belhaven Press.
- Vletas, S. & Vletas, K. (1999). *Fly fishing the Bahamas*. New York, NY: The Lyons Press.
- Wall, G., and Matheson, A. (2006). *Tourism, Change, Impacts and Opportunities*. Essex. UK: Prentice Pearson Hall Pub.
- Wall, G. (1997) "Is ecotourism sustainable?", *Environmental Management*, 21, 4, 1997, 483-491.
- Wallace, E.M., Adams, A.J., Wolfe, R.K., and Tringali. (2008) Rethinking the status of Albula spp. biology in the Caribbean and Western Atlantic. In *Biology and Management of the World Tarpon and Bonefish Fisheries*. Ed. Ault, J.S. pp. 203-214.

- Warwick, D. (2010). The titi project, traditional ecological knowledge and science: a critique. *Journal of the Royal Society of New Zealand*, 40(2), 39–43.  
doi:10.1080/03036758.2010.493943
- Watson, D.L., Harvey, E.S., Kendrick, G.A., Nardi, K., and Anderson, M.J. (2007) Protection from fishing alters the species composition of fish assemblages in a temperate-tropical transition zone. *Marine Biology*, Vol. 105, Iss. 5, 1197-1206.
- Wearing, S., and Neil, J. (2000). *Ecotourism: Impacts, Potentials and Possibilities* (pp. 1–160). Woburn, MA: Reed Educational and Professional Publishing Ltd.
- Weaver, D. (2001). Ecotourism in the Context of Other Tourism Types. In D. Weaver (Ed.), *Encyclopedia of Ecotourism* (p. 73=84). New York, NY: CABI Publishing.
- Weaver, D. (2002). The evolving concept of ecotourism and its potential impacts. *International Journal of Sustainable Development*, 5(3), 252–265. Retrieved from <http://inderscience.metapress.com/index/avjdm2m9cp8wktmm.pdf>
- Weaver, D. (2006) Sustainable Tourism: Theory and Practice. London, Butterworth, Heineman pp. 240
- Weaver, D. (2013) Asymmetrical Dialectics of Sustainable Tourism: Towards Enlightened Mass Tourism. *Journal of Travel Research*, 53(2) 131-140.
- Weaver, D. (2015) Enlightened mass tourism as a ‘third generation’ aspiration for the twenty-first century. In M. Hughes, D. Weaver and C. Pforr (Eds.) *The Practice of Sustainable Tourism*, (pp. 11-25) Routledge Publishing, New York, NY.
- Weaver, D. B., and Lawton, L. J. (2007). Twenty years on: The state of contemporary ecotourism research. *Tourism Management*, 28(5), 1168–1179.  
doi:10.1016/j.tourman.2007.03.004
- Weaver, D.B., and Lawton, L. (2002). *Tourism Management* (2nd ed., p. 472). Milton, Queensland, Australia: John Wiley and Sons, Australia.
- Weaver, L., Glaser, M., Gorris, P., and Ferrol-Schulte, D. (2012). Decentralization and participation in integrated coastal management: Policy lessons from Brazil and Indonesia. *Ocean & Coastal Management*, 66, 63–72.  
doi:10.1016/j.ocecoaman.2012.05.001
- Wheeler, B. 1993. Sustaining the ego. *Journal of Sustainable Tourism*, 1(2): 121-9.
- Wheeler, B. (1994). Egotourism, sustainable tourism and the environment – a symbiotic, symbolic or shambolic relationship. In A. V. et al. Seaton (Ed.), *Tourism: State of the Art* (pp. 647–54.). Wiley, Chichester, UK.
- Wheeler, B. (2006) *Sustainable Tourism: Theory and Practice*, Routledge, London.



- Wight, P. (1998) Tools for sustainability analysis in planning and managing tourism and recreation in the destination. In Hall, M. and Lew, A. (Eds.), *Sustainable Tourism: A Geographical Perspective*. (pp. 75-91), Essex, UK., Addison Wesley Longmann Limited.
- Wolfe, B., Armitage, D., Wesche, S., and Brock, B. (2007). From isotopes to TK interviews: towards interdisciplinary research in Fort Resolution and the Slave River Delta, Northwest Territories. *Arctic*, 60(1), 75–87. Retrieved from <http://www.jstor.org/stable/10.2307/40513160>
- World Commission on Environment and Development (WCED) (The Brundtland Report) (1987) *Our Common Future*, Oxford University Press, London.
- Worldometers (2017) The Population and Demographics of the Bahamas. <http://www.worldometers.info/world-population/bahamas-population/> Accessed, May 2017.
- World Tourism Organization (1993) *Sustainable Tourism*, Madrid: World Tourism Organization. Available at <http://www2.unwto.org>, Accessed, Jan. 2019
- World Tourism Organization (2004) *Sustainable Tourism*, Madrid: World Tourism Organization. . Available at <http://www2.unwto.org>, Accessed, Jan. 2019
- World Travel & Tourism Council (WTTC) (2016) 2016 *Economic Impact Annual Update Summary*. Retrieved, Feb. 2017 - <https://www.wttc.org/research/economic-research/economic-impact-analysis/>
- Woo, M., Modeste, P., Martz, L., Blondin, J. O. E., Kochtubajda, B. O. B., Tutcho, D., and Modeste, W. (2007). Science Meets Traditional Knowledge : Water and Climate in the Sahtu ( Great Bear Lake ) Region , Northwest Territories , Canada. *Arctic*, 60(1), 37–46.
- Worth, S. (1980). Margaret Mead and the Shift from “Visual Anthropology” to the “Anthropology of Visual Communication. *Studies in Visual Communication*. Vo. 6, Issue 1, Pp.15-22.
- WWF. (2000). Environmental degradation aggravated by loss of traditional knowledge , warns. *Business World*, 1–2.
- Wyatt, S., Fortier, J.-F., Natcher, D. C., Smith, M. a P., and Hébert, M. (2013). Collaboration between Aboriginal peoples and the Canadian forest sector: A typology of arrangements for establishing control and determining benefits of forestlands. *Journal of Environmental Management*, 115, 21–31. doi:10.1016/j.jenvman.2012.10.038

- Zeppel, H. (1998) Land and culture: sustainable tourism and indigenous peoples. In Hall, M. and Lew, A. (Eds.), *Sustainable Tourism: A Geographical Perspective*. (pp. 60-74), Essex, UK., Addison Wesley Longmann Limited.
- Zolfani, S.H., Sedaghat, M., Maknoon, R., and Zavadskas, E.K. (2015) Sustainable tourism: a comprehensive literature review on frameworks and applications. *Economic Research-Ekonomska Istraživanja*. Vol. 28, No. 1, 1–30.
- Zukowski, S., Curtis, A., and Watts, R. J. (2011). Using fisher local ecological knowledge to improve management: The Murray crayfish in Australia. *Fisheries Research*, 110(1), 120–127. doi:10.1016/j.fishres.2011.03.020
- Zwirn, M., Pinsky, M., and Rahr, G. (2005). Angling ecotourism: Issues, guidelines and experience from Kamchatka. *Journal of Ecotourism*, 4(1), 16–31. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/14724040508668435>

## Appendix A

### Ethics Letter, Request for Participation

University of Waterloo

July 2014

Dear (*insert participant's name*):

This letter is an invitation to consider participating in a study I am conducting as part of my Master's degree in the Department of **Geography and Environmental Management** at the University of Waterloo, in Waterloo, Ontario, Canada under the supervision of Professor **Sanjay Nepal**. I am also collaborating with the College of Bahamas, Department of Oral History and Tradition with assistance from Dr. Tracey Thompson. I would like to provide you with more information about this project and what your involvement would entail if you decide to take part.

The purpose of this study is to help preserve local fisheries resources for future generations. Tourism is a very important source of employment for Bahamians, without a healthy fishery this industry will fail. Better understanding fisheries resources will improve management of these resources ensuring future generations have the same opportunities that we have today. Through this study, with your help, I hope to create fisheries habitat maps, documenting your knowledge and stories.

Because you have been a long-time Bonefish guide, your time on the flats have given you a thorough understanding of local processes, your participation in this will greatly enhance the study results and conservation efforts.

Participation in this study is voluntary. It will involve an interview of approximately **two hours** in length to take place in a mutually agreed upon time and location. There is also a possibility that we will "ground truth" statements by visiting recognized locations in the field. If we decide to do this, time requirements will be greater, depending on travel times and distances. You may decline to answer any of the interview questions if you so wish. Further, you may decide to withdraw from this study at any time without any negative consequences by advising the researcher. With your permission, the interview will be **audio and video recorded** to facilitate collection of information, and later transcribed for analysis. Shortly after the interview has been completed, I will send you a copy of the transcript to give you an opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish. Your name will not appear in any thesis or report resulting from this study, however, since you will be recorded in audio and video, you may be recognized. Data collected during this study will be retained indefinitely for use by future Bahamian students and researchers. Data will be retained by me in a locked office in my supervisor's lab as well as the library of the College of the Bahamas. There are no known or anticipated risks to you as a participant in this study.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me at **1-519-386-1130** or by email at **tkarrow@uwaterloo.ca**. You can also contact my supervisor, Professor **Sanjay Nepal** at 519-888-4567 ext. **31239** or email **snepal@uwaterloo.ca**

I would like to assure you that this study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee. However, the final decision about participation is yours. If you have any comments or concerns resulting from your participation in this study, please contact Dr. Maureen Nummelin in the Office of Research Ethics in Canada, at **1-519-888-4567**, Ext.

36005 or [maureen.nummelin@uwaterloo.ca](mailto:maureen.nummelin@uwaterloo.ca). Please note, the Office of Research Ethics will accept collect calls should you wish to make a call.

I hope that the results of my study will be of benefit to future Bahamian researchers, will help further conserve valuable fisheries resources, and NGO's working to protect them. I also hope the College of the Bahamas benefits from your participation in this study.

I very much look forward to speaking with you and thank you in advance for your assistance in this project.

Yours Sincerely,

Tom Karrow, University of Waterloo

---

## Appendix B

### Ethics Acknowledgement of Participation Letter



Date:

Dear (*Name*);

I am writing to thank you for a stimulating conversations and meeting last week. Your experiences and time on the flats are highly commendable and it was indeed a pleasure meeting you. I am confident that future generations will benefit from the documentation you have permitted.

My project, Ghost Stories, Pioneering Bahamian Guide, their stories, their knowledge and opportunities for resource management is proceeding according to design. I hope you will get in touch with me if further thoughts occur to you about the subject of our conversation, and should you recall a contact with whom I should also interview, please feel free to inform me of this person.

Should you have any comments or concerns you could also contact Dr. Maureen Nummelin, the Director, Office of Research Ethics, at 1-519-888-4567, Ext. 36005 or [maureen.nummelin@uwaterloo.ca](mailto:maureen.nummelin@uwaterloo.ca). Please note, the Office of Research Ethics will accept collect calls should you wish to make a call.

This project was reviewed by, and received ethics clearance through a University of Waterloo Research Ethics Committee.

Sincerely,

Tom Karrow, PhD Candidate, University of Waterloo, Waterloo, Ontario, Canada

College of the Bahamas, Research Fellow

## **Appendix C**

### **Ethics Letter for Consent to Participate**

#### **CONSENT FORM**

By signing this consent form, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

---

I have read the information presented in the information letter about a study being conducted by Tom Karrow of the Department of Geography and Environmental Management at the University of Waterloo. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted.

I am aware that I have the option of allowing my interview to be audio and video recorded to ensure an accurate recording of my responses.

I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher.

This project has been reviewed by, and received ethics clearance through a University of Waterloo Research Ethics Committee. I was informed that if I have any comments or concerns resulting from my participation in this study, I may contact the Director, Office of Research Ethics at 519-888-4567 ext. 36005.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

☐ YES   ☐ NO

I agree to have my interview audio recorded.

☐ YES   ☐ NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.

☐ YES   ☐ NO

Participant Name: \_\_\_\_\_ (Please print)

Participant Signature: \_\_\_\_\_

Witness Name: \_\_\_\_\_ (Please print)

Witness Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **Appendix D**

### List of Interviewees (n=77)

(Home Island, guide name, and years of guiding experience at the time of interview (2014-2018))

#### **Bonefish Guides (n=71)**

##### **Abaco (n=12)**

Buddy Pinder – 25 years guiding  
Clint Kemp – 12 years guiding  
Dana Lowe – 7 years guiding  
Donnie Lowe – 37 years guiding  
Joe Bodie – 35 years guiding  
Justin Sands – 20 years guiding  
Maitland Lowe (deceased) – 49 years guiding  
O'Donald McIntosh (deceased) – 49 years guiding  
Riccardo Burrows – 29 years guiding  
Thomas Albury- 14 years guiding  
Travis Sands – 14 years guiding  
Trevor Miller – 9 years guiding

##### **Andros (n=32)**

###### *North Andros*

Bradley Mackie – 27 years guiding  
Charlie Neymour – 27 years guiding  
Charlie Smith (deceased) – 60 years guiding  
David Neymour – 17 years guiding  
Frankie Neymour – 27 years guiding  
Harold Mackie – 35 years guiding  
Henry Bain – 10 years guiding  
Herman Bain – 19 years guiding  
Nelson Leadon (deceased) – 40 years guiding  
Phillip Rolle – 10 years guiding  
Rudolph Timer Coakley – 60 years guiding  
Samual Raymond Mackie – 26 years guiding  
Shawn Leadon – 25 years guiding  
Thomas Mackie (deceased) – 57 years guiding  
Prescott Smith – 24 years guiding

###### *Mangrove Cay (Central Andros)*



Ralph Moxey – 60 years guiding  
Alvin Greene – 16 years guiding  
David Russel Jr. – 10 years guiding  
Douglas Saunders – 11 years guiding  
Eddie Bannister (deceased) – 55 years guiding  
Leslie Greene – 15 years guiding  
Mark Bastian – 20 years guiding  
Ornald Greene – 24 years guiding

#### *South Andros*

Burnt Ferguson – 16 years guiding  
Jeffrey Ferguson – 37 years guiding  
Stanley Forbes (Jolly Boy) – 34 years guiding  
Nathanial Adams – 38 years guiding  
Ronnie Bain – 15 years guiding  
Harlon Sands – 25 years guiding  
Samuel Mackie (Sparkles) - guiding 32 years  
Tim Smith – 28 years guiding  
Tracey Knowles – 2 years guiding

#### **Bimini (n=4)**

Ansil Saunders -59 years guiding  
Tommy Sewell – 37 years guiding  
Bonefish Ebbie David– 30 years guiding  
Fred Rolle – 37 years guiding

#### **Exuma (n=4)**

Steve Ferguson – 32 years guiding  
Drex Rolle – 22 years guiding  
Garth Thompson – 19 years guiding  
Reno Rolle – 23 years guiding

#### **Grand Bahama (n=19)**

Cleophis Bevins (Bully) – 30 years guiding  
Carl Rolle – 35 years guiding  
Tommy Rolle – 39 years guiding  
David Pinder – 45 years guiding

Jeffery Pinder – 27 years guiding  
David Pinder Sr. – 59 years guiding  
Harry Rolle – 15 years guiding  
Jason Franklin – 12 years guiding  
Ishmail Thomas – 18 years guiding  
Joseph Pinder – 30 years guiding  
Leroy Glinton – 40 years guiding  
Mervin Thomas – 40 years guiding  
Omeke Glinton – 22 years guiding  
Stanley Glinton – 48 years guiding  
Perry Demeritte (deceased)  
Shervin Tate – 4 years guiding  
Simeon Higgs – 15 years guiding  
William Pinder – 45 years guiding

*Other, non-guides (n=6)*

Dr. Tracey Thompson, University of The Bahamas, Department of Oral History and Tradition, “From Dat Time”. Nassau, New Providence, Bahamas

Mr. Benjamin Pratt, Bahamas Ministry of Tourism, Sustainable Tourism Branch, Nassau, New Providence, Bahamas

Miss Cindy Pinder, Secretary, Abaco Guides Association, Cherokee Sound, Abaco, Bahamas

Mr. Basil Minns, Elder and former guiding manager in Georgetown, Exuma, Bahamas

Miss Magnolia Morley, Peace and Plenty Club Manager, Georgetown, Exuma, Bahamas

Miss Cheryl Bastian, Owner Swains Cay Lodge, Director on the Bahamas Out Island Tourism Board

## **Appendix E**

A co-authored published book chapter focused on challenges related to political ecology in the Bahamian flats fishing industry. Published as:

Karrow, T., and Thompson, T. (2016) The Political Ecology of the Bahamian Flats Fishing Industry, In Political Ecology and Tourism, Rutledge Publishing, ed. Sanjay Nepal and Jarkko Saarinen. Chapter 2.

### **Political ecology of the flats fishing industry in the Bahamas**

Thomas Karrow & Tracey Thompson

#### **Introduction**

Political ecology in tourism inherently deals with stakeholder power imbalances and tensions arising from inequitable allocation of resources resulting from tourism related drivers (Stonich, 1998). Tourism is one of the worlds' largest industries, accounting for nearly 30% of global trade (WTO, 2006), and growth is expected to reach 1.8 billion international arrivals by 2030, nearly a doubling of the current (1 billion) annual arrivals (Scott, Gössling, & Hall, 2012). Particularly dependent on tourism, the Caribbean is often cited as “ the most tourist-dependent area in the world” (Patterson & Rodriguez, 2003, p. 77).

Tourism inevitably results in wide-ranging changes to economies, social structures and ecosystems (Wall & Matheson, 2006). Tropical small-island ecosystems common throughout the Caribbean, are particularly vulnerable; affected by coastal development pressures and resource exploitation (Gössling, 2003). The Bahamas are not immune to tourism strains, nor is the small yet highly lucrative bonefishing industry. The Bahamas bonefishing industry (BBI) is not a typical mass tourism industry. Rather, sparsely distributed, exclusive, low-volume lodges catering to wealthy travelling anglers characterize it. The BBI verges on ‘ecotourism’ in practice, although verifying this is beyond the scope of this chapter. From a political ecology perspective, the industry is a model case of diversified stakeholders with varied needs; a result of historical partition resulting in tension around resource access.

According to Robbins (2004), political ecology is characterized by four ‘dominant narratives’: degradation and marginalization, environmental conflict, conservation and control, and environmental identity and social movements. Political ecology is often about tensions over resource access and controls (Paulson, Gezon & Watts, 2003), and power allocations (Cole, 2012). Arlinghaus (2007) argues there are pressing needs to identify, understand and manage human conflicts in recreational fisheries because such conflicts may retard progress towards generating sustainable recreational fisheries. All of these issues face the bonefishing industry in the Bahamas to some degree; neglecting to deal with these may hamper future conservation efforts and sustainability likelihoods.

Stakeholder imbalances and access to fisheries/conservation controls plague the tourism industry. Attempts to ensure resource sustainability have resulted in generation of marine protected areas (MPA's) and fisheries regulations, exacerbating issues relating to access to resources. Full no-take regulations are counter productive to the BBI, thus multi-use policies have been set, at times displacing artisanal angling opportunities. Moreover, BBI guides voluntarily enforce Bonefish regulations resulting in potential division with community members. Though small, this vital tourism sector is unique, and through sustainable resource management, political ecological power imbalances may in part dissolve.

In this chapter, the political ecology of the Bahamian Bonefishing industry is the focus through examining stakeholders, their access to resources and conservation control, and power imbalances. We begin by examining the geography and history of the Bahamas, and the history of the Bonefishing tourism industry. This context is vital to understanding stakeholders and issues facing this sector. We continue by more closely examining stakeholders, power imbalances and access to fisheries resources across the Bahamas. Finally, we conclude the chapter by illustrating the importance and uniqueness of the industry, highlighting recent favorable management trends that are alleviating political ecological power imbalances and creating a more sustainable recreational tourism fishery sector.

## **Geographical and historical synopsis of the Bahamas**

The Commonwealth of the Bahamas forms an archipelago lying off the southeast coast of the continental United States (US; (Figure 2.1) The Bahamas are a collection of “29 islands, 661 Cays (pronounced ‘Keys’), and 2387 rocks” (Craton, 1986 p.11). The island of Bimini lies farthest to the west at only 58 nautical miles from the US, and the southernmost islands in the Bahamian chain reach southward to the Turks and Caicos, once part of the Commonwealth. Close proximity to the US has afforded ready access to tourists for decades, and the US remains the largest source of tourists today (Bahamas, 2014).

Geographically, the Bahamas are low and agriculturally infertile. Cat Island at 206 feet above sea level has the highest elevation in the Bahamas, leaving climate change and associated sea level rises, important issues to be faced in the near future. Agricultural production potential has conventionally been regarded as low in the Bahamas, and access to fresh water limited. Shallow soil profiles and high saltwater tables negate significant agricultural efforts (Craton, 1986). Early colonial industry while based on agriculture (cotton, pineapple and sugar cane) is largely extinct, leaving tourism the single most important industry in the Bahamas (Saunders, 1991), consistent with many Caribbean tourist destinations and small island developing states (SIDS) (Hampton & Jeyacheya, 2013; McElroy & Parry, 2010; Seetanah, 2011). A temperate sub-tropical climate across the Bahamas bodes well for 3S, Sun, Sand and Sea) tourism. According to Craton (1986, p. 12), the Bahamas are known as the “Islands of Perpetual June” lending to favorable 3S tourism.

The Bahamas achieved self-governance in 1964, officially separating from Great Britain on July 10th, 1973 (Craton, 1986). A slavery-based, colonial past

perpetuates current issues. Low education levels, poverty, and financial/political imbalances challenge many Bahamians, especially among the now largely black majority (Bahamas Ministry of Tourism, 2010). Economic opportunities are sparse and allegations of corruption at all levels of government perpetuate (The Heritage Foundation, 2013). These socio-economic, and political issues have pivotally shaped current cultural divides. The need for expanding employment opportunities, increasing local ownership in the economy, maintaining foreign investment, and emphasizing ongoing social development across the Bahamas are vital. Providing these essentials, in an environmentally sustainable fashion, is challenging yet critical. Small-scale tourism ventures like those associated with Bonefishing may be part of the solution.

### *Tourism in the Bahamas*

Tourism in the Commonwealth of the Bahamas has a lengthy history, ‘officially’ originating in 1851 with legislative passing of the Tourism Encouragement Act (Bahamas, 2014). Succeeding Acts in 1854 and 1857 authorized governmental acquisition of lands for construction of early hotels, and in 1859 an agreement with Samuel Cunard of the legendary steamship line, brought regular guaranteed service to Nassau (the capital), cementing the country’s cruise industry (Bahamas, 2014; Craton & Saunders, 1998). Cruise tourism characteristically dominated by “excessive foreign ownership and vertical integration of multinational corporations, (Patterson & Rodriguez, 2003 p. 77), yields the majority of tourists to the Bahamas in contemporary times (Bahamas, 2010).

The establishment of the Bahamian Tourism Development Board in 1914 played a major role in promoting tourism to the islands. “Out Island” or “Family Island” tourism (tourism to islands other than New Providence or Grand Bahama), began shortly thereafter (in 1919) with the advent of aviation travel, and by 1929, Pan American airlines was travelling between Florida and Nassau on a daily basis (Bahamas, 2014). Bethel (1989) and Debbage (1991) refer to Bahamian tourism as “enclave tourism”, characterized by centralized hotels and casinos in Nassau with particular reference to Paradise Island. Enclave tourism, as noted by Saunders (1991), prevents cross-cultural interactions, associated understandings, and in the Bahamas, has worked to further isolate racial groups compounding historical issues and the “deeply-entrenched feelings of inferiority” among the black populous.

A noteworthy documented milestone in Bahamian Tourism occurred in 1924 through establishment of the Bimini Rod and Gun Club (Bahamas, 2014). The first of its kind in the Bahamas, this lodge devoted to hunting and fishing, and catered to wealthy anglers seeking large pelagic fish like billfish and tuna species made notable by the likes of Ernest Hemingway. The Bimini Big Game Club was pivotal in the development of the BBI, offering a model for an evolving industry, now generating \$141 million (USD) annually (Fedler, 2010).

Bahamian tourism developed irregularly as a result of world wars, prohibition, the Great Depression and numerous other factors. Consistent during this period was centralized foreign-owned tourism in Nassau such that in 1989 a study surveying

Bahamians on their impressions of the industry identified negative tones towards tourism as a result of associated foreign ownership and leakages (Bethel, 1989). Despite industry growth, early tourism in the Bahamas was overshadowed by tourism in Cuba. Political shifts in Cuba in the late 1950's and early 1960's, and the transition to a communist regime, resulted in travel embargoes for American travelers thus forcing them elsewhere (Bahamas, 2014). A large cohort of tourists shifted from Cuban tours to the Bahamas, centered primarily in Nassau with glimmers of development on Grand Bahama Island. Family Island developments remained relatively stable until the 1990's when much needed and welcome growth took place on many islands including Andros, Abaco, Acklins, and Exuma, (see Figure 1), largely a result of the developing Bonefishing industry.

Historically, early tourism efforts in the Bahamas accentuated historical class and racial alienation, in part to meet tourist expectations (Palmer, 1994), and imagery of 'paradise' ensued (Strachan, 2002). Tourists were presented with images of pristine white sandy beaches with wealthy white travelers, basking on the sun while local black Bahamians by law were excluded from popular tourist destinations to perpetuate the paradise myth (Strachan, 2002). Images of 'colonial Britain' have also been established, "marginalizing" African heritage. These "images of the colonial past, immortalized the ideology of colonialism..." (Palmer, 1994, p. 792), such that the industry, "is inextricably linked to the historical process of colonization, the legacy of which has firmly returned control of the country's tourism development to just those who once exercised colonial possession" (Britton, 1982, p. 347). This has effectually exacerbated historical hostilities preventing development of a Bahamian national identity, an issue facing the Bahamas currently. Moreover, tourism by its very nature is service based, as Crick (1988, p. 59) explains: "tourism is associated with servility and reawakens memories of a colonial past, perpetuating resentments and antagonisms that affect the touristic encounter." Indeed, this phenomenon is not unique to the Bahamas although it may be more pronounced given a longer history of occupation and European exploitation. Commonly referred to as 'black servility theory' in related literature by Weaver & Lawton (2002, p. 280), the theory identifies a "belief that tourism, in regions such as the Caribbean or South Pacific, is an activity that perpetuates the subjugation of formally colonized or enslaved peoples, for maintenance of the service (black) and served (white) relationship". This 'subjugation' has led to contemporary patterns of segregation, power imbalances, and socio-economic and cultural issues.

Despite deeply seeded racial divides and colonialization-based resentments, tourism in the Bahamas in 2005 accounted for more than \$2 billion (Cleare, 2007), and today it accounts for 50% of all jobs and about 60% of the 2012 GDP (Heritage Foundation, 2013). With a 2010 population of 350,000 residents (COB, 2010), and tourist arrivals of over 2 million in 2008 (Bahamas Ministry of Tourism 2012), tourists outnumber Bahamians by 4 to 1. Tremendous tourism-based growth has inevitably resulted in haphazard development, environmental degradation, diverging stakeholder priorities, challenges with access to resources and conservation control issues.

### *Bonefishing tourism*

Bonefish (*Albula vulpes*) have been important local fare for centuries in the Bahamas according to the archaeological record (Sinelli, 2010), and oral tradition. In recent years, their importance has been magnified through tourism. Angling for Bonefish is conducted in shallow tropical waters (flats), available extensively throughout the Bahamas. Apparently, Columbus renamed the Bahamian Islands “Baja Mar”, meaning “shallow sea”, a reflection of the extensive “flats” surrounding the Bahamas (Vletas & Vletas, 1999). When bonefishing, local guides are sought for their extensive local knowledge on tides, seasonal migrations, water temperature fluctuations, food availability and a host of other variables affecting fish movements. Early guides were local Bahamians familiar with hand lining or netting bonefish (‘hauling’) for subsistence purposes and had keen abilities to see the “ghost of the flats” as bonefish are known due to their ability to effectively camouflage (Brown, 2008). Family Island residents, proficient in catching Bonefish, quickly became full time “guides” for recreational angling tourists. Guiding for bonefish today is a highly lucrative source of income, offering opportunities where little else is available (Figure 2.2 & 2.3). With an annual GDP of US \$20,000 in the Bahamas, or a weekly income of about \$380 (World Bank, 2012), daily angling guide rates of \$275 plus a \$100 tip equate to weekly incomes of \$1875, significantly higher than average income (Glinton, 2014; Rolle, 2014; Smith, 2013; Tate, 2014). Guiding positions are highly valued and grassroots organizations like the Bahamas Fly Fishing Industry Association (BFFIA) and the Bahamas Sport Fishing Conservation Association (BSCA) originated in part, to provide a guiding certification program for skills standardization. These organizations offered professional guiding services and helped protect valuable local marine resources vital for the tourism industry. These non-governmental organizations (NGO) are key stakeholders in conservation measures benefitting the industry, although benefits arguably affect only a few of the many Bahamians (BFFIA, 2014; BSCA, 2014). Non-native NGO’s including Bonefish and Tarpon Trust (BTT), the Fisheries Conservation Foundation (FCF), and the Nature Conservancy also work to conserve Bonefish habitat for the industry.

Unlike conventional mass tourism, small lodges accommodating up to 12 anglers typify this industry. Angling lodges cater to high spending, up market clientele in a lucrative, low-density periphery-based niche tourism model. Most anglers originate from the US, are male, exhibit higher education and income levels than average, and are vastly different racially, educationally, and economically from most Bahamians (Bahamas, 2010). Lodges provide employment opportunities to local citizens in the form of angling guides, maintenance workers, boat mechanics, as well as culinary and housecleaning services. The economic impact of this high-value form of tourism is substantial, yet highly concentrated. On some Bahamian islands like Andros, up to 80% of the population is reportedly employed through this industry although proportional influence on most islands is much less (Fedler, 2010). Local market-based economies typical to many tourism destinations are not in place in this industry leaving locals not associated directly with the industry potentially polarized as a result of economic

exclusion and diverging priorities. Numerous untapped opportunities exist for entrepreneurial locals not involved in the BBI to capitalize on the industry through secondary or even tertiary enterprise.

Historically lodges have been foreign owned, which is primarily a function of wealth distribution and Bahamian history. However, through guiding opportunities and entrepreneurial enterprise, a growing number of successful Bahamian guides are developing their own lodge businesses. Some of these include Grand Bahama Bonefishing on Grand Bahama, Big Charlie's Lodge on Andros, and the Andros Island Bonefishing Club, among others. Repeat clientele are critical in either model, comprising upwards of 90% of business, and well established, long-time guides have wait lists for their services during peak angling times (Glinton, 2014; Leadon, 2014; Rolle, 2014; Smith, 2013). Legendary guides now pass their knowledge and trade onto their children fostering a "family tradition" while illustrating temporal importance of the industry.

### **The Bonefishing industry**

Participating anglers access a unique resource (bonefish), practice catch and release, and help fund conservation projects to preserve the fishery through donation to NGO's like BTT and FCF, as well as angling tournaments. Bonefishing tourism provides tremendous economic advantage to select Family Island communities like guides and lodges. These benefits far exceed the opportunities available through artisanal or even commercial netting of bonefish. Consequently, the state has implemented special regulations for Bonefish. Across the Bahamas, it is illegal to net Bonefish or sell them for commercial gain (Bahamas, 2012). Regulations however do not ensure compliance, and given the geographical extent of the Bahamas, enforcement of such fisheries regulations is virtually impossible. Ethical behaviors premised on resource protection are profound within the industry; guides and anglers illustrate a stewardship zeitgeist, countering traditional artisanal angling still practiced by many Bahamians for subsistence. Although the industry itself appears to be a 'win-win' scenario of sustainable fisheries use, many Bahamians are excluded, access to resources are inequitable, conservation initiatives are biased towards the BBI, and financial leakages are very high. In the Bahamas, tourism leakages are as high as 90% (Fedler, 2010). Consequently the BBI is not as 'sustainable' and beneficial to the islands as initially portrayed. For the most part, it has been wealthy American anglers dictating generation of protected areas, funding research through donation, and promoting angler education for angling best practice, all while leakage occurs at alarming rates, local citizens are excluded from traditional fishing grounds and a select few Bahamians potentially benefit. However, the industry has the potential to exemplify sound sustainable resource management from a tourism related driver, and recent trends towards inclusion and co-management illustrate this. While tourism related developments frequently counter conservation measures, the BBI may work to the contrary.



### *Stakeholders in the Bonefishing tourism industry*

Accommodating the needs of multiple stakeholders is challenging, if not impossible. Frequently regarded as a “social equalizer”, tourism realistically results in social inequities (Patterson & Rodriguez, 2003). The BBI is no exception to this, with travelling anglers, travel companies, lodge owners (foreign and local), local guides, local citizens, local and international NGO’s, educational institutions, and government departments all potential decision-makers with dissimilar motivations. Ergo, the BBI has been largely unregulated, unidirectional, and for the most part inert in terms of environmental degradation owing to proportionately low visitor numbers and stewardship ideologies implicit in the clientele. However as growth occurs, entrepreneurs inevitably establish new guiding ventures, clear land for new lodges, and place greater stress on fragile environments.

Tourism in the Bahamas is paramount, the Ministry of Tourism is vital to prosperity, and they hold significant influence in decision-making. However, there are allegations of widespread corruption within government and the tourism ministry (Foundation, 2013). The Ministry of the Environment (agriculture and marine resources), plays a role in management around coastal developments in the Bahamas (associated with tourism and other), yet appears to possess less sway in decision-making than the Ministry of Tourism, given the economic vitality of the tourism sector. Small-scale tourism industries like the BBI, while vital for some Bahamians, occupies a proportionally minuscule economic component, hence government recognition of the industry is low (Adams, 2014), and associated protections lacking. As Gössling (2003) notes, development in small island developing states (SIDS) is characterized by enclave tourism where powerful and influential international conglomerates (e.g., airlines, cruise lines, and hotels) determine the direction and the outcomes. Maximizing profit dictates focusing on mass tourism markets, along with foreign investments, and in the Bahamas this is dominated by cruise tourism and resort/casino tourism, not bonefishing. Moreover, decision making according to McElroy and De Albuquerque (2002), often bypasses local authoritative agencies and community opposition groups in SIDS resulting in negative impacts. These tendencies are likely at play in the Bahamas where only superficial governmental support and funding appear channeled to the industry when compared to other tourism funding. Recent proposed fisheries legislation may change this, the outcome from these is yet to be seen.

The Bahamas National Trust (BNT), established in 1959 through an Act of Parliament, has been instrumental in working to conserve Bahamian natural resources since its inception. Bonefishing sustainability has been a centerpiece in decision-making, given its economic importance, and BNT has worked to establish marine protected areas (MPA’s) across the Bahamas (BNT, 2014). In 2012, the “Master Plan for the Bahamas Protected Areas System” was completed in response to the 2008 Caribbean Challenge Initiative (CCI). The CCI facilitated governments across the Caribbean (originally, the Bahamas and one additional country), working to protect and manage sustainable marine and coastal environments. Since its inception, seven other Caribbean nations have signed on to this initiative (BNT, 2014). The Bahamas were set to establish 40 marine protected areas (MPA’s) by their 40th anniversary of independence, or 20% of the country protected by 2020. It should be noted according to

Stonich (1998), that local stakeholders frequently receive the fewest benefits from tourism with regard to income, patterns of consumption, and food security, while they concomitantly lose entitlements and livelihoods when faced with MPA development. Moreover, effective management of MPA's is "impossible because of the indispensability of integrating different scales of social, cultural and economic aspects and their dynamics into the design, management and evaluation of these areas" (Gössling, 2003, p. 19). This analysis, if accurate, implies that MPA's developed in the Bahamas largely through impetus from the BBI may have adverse impacts upon local stakeholders while potentially proving unable to bring about positive environmental benefits.

### *Collaboration and conflict*

The Bahamas National Trust (BNT) originally emanated through environmentally concerned, largely wealthy, white, citizens recognizing resource declines in the Bahamas. Working with US entities such as The National Audubon Society in 1905 (BNT, 2014), a group of ecologically minded individuals formed the BNT and received official parliamentary approval with sparse input from a growing black majority. This non-inclusive approach continues to be an issue today although recent government appointments to the BNT board have diversified the once homogenous institution.

The BNT attempts to facilitate collaboration between the government and bonefish conservation NGO's like the BFFIA, BTT, and the FCF. While science funded through these NGO's have furthered understanding of vital flats species including Bonefish, fear of external control (non-Bahamians) result in tensions. Domestic NGO groups like the BSCA and the BFFIA question the motivations of external agencies who fund these scientific studies and their conclusions. Both BSCA and the BFFIA have conservation and education as cornerstones of their agenda, as do BTT and FCF, but collaboration has largely been reluctant and progression stagnant. Underlying mistrust of attitudes and motivations, resentment of significant power imbalances, and fear for exploitive encroachments upon knowledge, employment opportunities, or scientific information appear to block evolution towards co-management, sustainability and resolution of political ecology issues. These issues may emanate from early colonial exclusionary practices, the ongoing impact of historical racial inequities, social stratification, and negative experiences. As Patterson and Rodriguez (2003, p. 67) point out, "Failure to consider difficult historical realities (imperialism, slavery, ongoing racism, among others)... risks misunderstanding current power relations, and preempts opportunities for more equitable future outcomes." While their focus is Dominica, similar issues are prevalent in the Bahamas.

Effective resource management planners must consider ideological differences pertaining to place and time for effective collaboration. As Gössling (2003, p. 27) points out, "from a cultural point of view, island populations may have conceptions of time that are fundamentally different from those in western societies." Operating according to western conceptions of time results in bypassing consultation when considering management decision-making; this is negatively viewed by islanders in the

Bahamas. Moreover, Palmer (1994, p. 806) argues that, “individual Bahamians are caught in a kind of time-warp that hinders their ability to progress from, and out of, the myths and stereo-types propagated under colonial rule.” While US based NGO’s have favorable intentions, past strategies are questionable to islander doctrine; recent employment of Bahamians by some US-based NGO’s may alleviate these cultural divides.

A potential arbitrator in these ‘issues/disputes’ is the College of the Bahamas (COB) whose overarching goal is unbiased social progression through education. Despite this, a majority of research and resource planning around the Bonefishing industry has foregone COB input and little collaboration between COB, BNT, BFFIA, BSCA, BTT or FCF takes place.

Central to the Bonefishing industry are fisheries resources and tourism sustainability. Butler (1993, p. 29) defined sustainable tourism in small islands as, “developed and maintained in an area (community, environment) in such a manner and at such a scale that it remains viable over an indefinite period and does not degrade or alter the environment (human and physical) in which it exists to such a degree that it prohibits the successful development and well being of other activities and processes”. By and large the BBI has a moderate environmental impact. Habitat loss directly associated with the industry is minimal when compared to mass tourism developments. Angled fish are caught and released, although considerable debate surrounds efficacy of the practice in terms of post-release mortality (Bartholomew & Bohnsack, 2005; Cooke & Suski, 2005; Policansky, 2002)). The guides and anglers recognize the value of the fish. It is tempting to conclude that bonefishing is a sustainable form of tourism, according to Butler’s (1993) definition. The reality, however, is much more complicated, as discussed in the preceding sections.

Recognizing the importance of this industry to Family Island residents in the Bahamas is elementary; clear financial benefits and employment opportunities have resulted in areas of previously sparse economic activity. On a global scale, recreational fisheries have been recognized as highly significant to local and regional economies (Cooke & Cowx 2006). This is absolutely the case for Bahamian Family Island communities. Additionally, though commercial angling in many Bahamian Family Island communities exists, the financial “value of recreational fisheries often outweighs that of commercial fisheries and thus their sustainability is paramount to society in general” (Cooke & Cowx, 2006 p. 104). This is also true in the Bahamas where Bonefishing is a highly lucrative opportunity.

As noted, the BBI is relatively small, yet financially important and likewise powerful when united. Conservation initiatives benefit travel companies, NGO’s, government sectors, BBI anglers, lodges and guides, but may marginalize locals not associated with the industry as access to artisanal fishing grounds are limited through generation of MPA’s or legislative angling restrictions. Consultation, education and co-managed decision-making are critical to reducing potential hostilities, previously generated trust issues and communication deficiencies. Moreover, economic diversification opportunities related to the industry abound yet have not been capitalized on to date.

Some decision-making authorities within the Bahamas appear heavily influenced by financial and political gains. Numerous failed resort developments across the Bahamas do not appear to hamper future development proposals, which have far greater ecological and economic implications than developments associated with the BBI. While international NGO's with angling preservation agendas have political and economic sway, their weight is marginal when compared to mass tourism ventures. Unifying and unidirectional communication across the Bahamas centered on the BBI will potentially lead to greater sustainability of the industry, and preservation of the country's coastal ecosystems, vital to all Bahamians and visiting tourists beyond the niche angling market. Overcoming issues of access to resources, conservation control, inequity and power imbalances will be vital to this end; recent revitalized initiatives by BTT, BNT and BFFIA appear positive.

## Conclusions

The Bahamas are uniquely situated in Caribbean tourism to offer a wide diversity of activities owing to varied environments and associated recreational pursuits. Unlike most small Caribbean island tourism markets, the Bahamas are a conglomeration of 700 islands making them geographically extensive. Gössling (2003, p. 23) points out that central to all of the cases studied in his anthology, *Tourism and Development in Tropical Islands*, most ecosystems have already undergone 'substantial ecological alterations long before the advent of tourism'. In much of the Bahamas, this is not the case given the historical centralization of mass tourism opportunities and relatively sparse economic prosperity elsewhere. Family Islands, (excluding New Providence and Grand Bahama) are largely untouched, pristine natural ecosystems that are now facing greater threats of development in the form of cruise ports, casinos, and mega resorts as government officials are wooed by international conglomerates. Indeed, if historically induced issues including racial and stakeholder tensions in the BBI can be overcome, the future ecology of many Bahamian islands will remain viable thanks to recognition for healthy fisheries and associated ecosystems.

Centralization of mass tourism in the Bahamas has in essence been a blessing, providing opportunities for tourism diversification in Family Islands. This geographical marvel, if managed properly, will afford the Commonwealth of the Bahamas tourism diversity and ecological preservation through mass tourism. Family Island small-scale ecotourism ventures or other nature-based tourism industries like the BBI will prosper if political ecological issues can be overcome, making the Bahamas, a 'best of both worlds' model of tourism. This breadth in tourism offerings is truly unattainable elsewhere in the Caribbean, and is an attribute that should be cherished and promoted in the Commonwealth. Recent progression in resource management policy, practice and governance in the Bahamas appear positive. Challenges surrounding access to resource privileges, conservation control and inequity are being addressed through collaboration, consultation and education. Current relationship building and policy changes provide hope for the future of the Bahamas tourism industry and ecology.

## References

- Adams, A. (2014) *Personal communication*. Bonefish and Tarpon Trust. Key Largo, Florida. [www.btt.org](http://www.btt.org)
- Arlinghaus, R. (2007). Voluntary catch and release can generate conflict within the recreational angling community: a qualitative case study of specialized carp (*Cyprinus carpio* L.) angling in Germany. *Fisheries Management and Ecology*. 14, 161-171.
- Bahamas Ministry of Tourism. (2010). *2010 Census of Population and Housing*. Nassau, Bahamas. Retrieved from <http://www.tourismtoday.com/home/statistics/> accessed May, 2015
- Bahamas Ministry of Tourism. (2012). Research and statistics department bahamas ministry of tourism 2012. Retrieved from <http://www.tourismtoday.com/home/statistics/> accessed May, 2015
- Bahamas Ministry of Tourism. (2014). The History of the Ministry of Tourism. Retrieved from <http://www.tourismtoday.com/home/about-2/tourism-history/> accessed May, 2015
- Bahamas Fly Fishing Industry Association (2014). [www.bffia.org](http://www.bffia.org) accessed Sept, 2014
- Bahamas Sportfishing Conservation Association (2014) [www.bsca.org](http://www.bsca.org) accessed Sept. 2014
- Bank, W. (2012). *Hidden harvest: the global contribution of capture fisheries. Report No. 66469-GLB*. Washington: International Bank for Reconstruction and Development, pp. 152.
- Bartholomew, A. & Bohnsack, J. A. (2005). A review of catch-and-release angling mortality with implications for no-take reserves. *Reviews in Fish Biology and Fisheries*, 15(1-2), 129–154. doi:10.1007/s11160-005-2175-1
- Bethel, F. (1989). Tourism, public policy, and national development in the Bahamas. In D.W. Collingwood and Dodge, S. (Eds.) *Modern Bahamian Society* (pp. 129-138). Parkersburg: Caribbean Books.
- BNT, TNC, M. (2014). *40th Anniversary of the Bahamas. Proposal for the expansion of the protected area system of the Commonwealth of the Bahamas* (pp. 1–34). Nassau, Bahamas.
- Britton, S.G. (1982). The political economy of tourism in the Third World. *Annals of Tourism Research*, 9, 331-358.

- Brown, D. (2008). *Fly fishing for Bonefish*. Guilford, CT: Lyons Press.
- Butler, R. (1993) Tourism - an evolutionary perspective. In J.G. Nelson, R. Butler and G. Wall (Eds.) *Tourism and sustainable development: Monitoring, planning, managing*. Waterloo: University of Waterloo, Department of Geography, Publication Series No. 37.
- Cleare, A. B. (2007). *History of tourism in the Bahamas: A Global Perspective*. USA: Xlibric Corporation.
- Cole, S. (2012). A political ecology of water equity and tourism. *Annals of Tourism Research*, 39(2), 1221–1241. doi:10.1016/j.annals.2012.01.003
- College of the Bahamas. (2010). *2010 Census of Population and Housing*. Nassau, Bahamas: Department of Statistics.
- Cooke, S. J. & Cowx, I. G. (2006). Contrasting recreational and commercial fishing: Searching for common issues to promote unified conservation of fisheries resources and aquatic environments. *Biological Conservation*, 128(1), 93–108. doi:10.1016/j.biocon.2005.09.019
- Cooke, S. J. & Suski, C. D. (2005). Do we need species-specific guidelines for catch-and-release recreational angling to effectively conserve diverse fishery resources? *Biodiversity and Conservation*, 14(5), 1195–1209. doi:10.1007/s10531-004-7845-0
- Craton, M. (1986). *A history of the Bahamas* (3rd edition). Waterloo, Ontario, Canada: San Salvador Press.
- Craton, M. & Saunders, G. (1998). *Islands in the Stream: A History of the Bahamian Preiple*, 2 vols. University of Georgia Press, Athens
- Crick, M. (1988) Sun, sex, sights, savings and servility: Representations of international tourism in the social sciences. *Criticism, Heresay and Interpretation*, 1, 37-76.
- Debbage, K. G. (1991) Spatial behaviour in a Bahamian resort. *Annals of Tourism Research*, 18, 251-269.
- Fedler, T. (2010). The economic impact of flats fishing in the Bahamas, (March). Gainesville, Florida. Special independent report prepared for The Bahamian Flats Fishing Alliance
- Glinton, O. (2014). *Personal communication*, Deep Water Cay, Grand Bahama Island.

- Gössling, S. (2003). Tourism and development in tropical islands: Political ecology perspectives. In S. Gössling (Ed.). *Tourism and development in tropical islands* (pp. 1–38). Northampton, MA: Edward Elgar Publishing Inc.
- Hampton, M.P. & Jeyacheya, J. (2013). *Tourism and inclusive growth in small island developing states*. London, UK: Commonwealth Secretariate, The World Bank.
- Leadon, S. (2014) Personal Communication. Andors Island Bonefish Club, Bering Point, Andros Island, Bahamas. <http://www.androsbonefishing.com>. Accessed, October, 2015
- McElroy, J.L. & de Albuquerque, K. (2002). Problems for managing sustainable tourism in small islands. In: Y. Apostolopoulos, and D.J. Gayls (Eds.). *Island tourism and sustainable development: Caribbean, Pacific and Mediterranean Experiences* (pp. 15-34). Westport, CT: Praeger.
- McElroy, J. L., & Parry, C. E. (2010). The characteristics of small island tourist economies. *Tourism and Hospitality Research*, 10(4), 315–328. doi:10.1057/thr.2010.11
- Palmer, C. A. (1994). The experience of the Bahamas. *Annals of Tourism Research*, 21(4), 792–811.
- Paulson, S., Gezon, L.L & Watts, M. (2003). Locating the political in political ecology: An introduction. *Human Organization*, 62, 205-217.
- Patterson, T. & Rodriguez, L. (2003). The political ecology of tourism in the Commonwealth of Dominica. In, S. Gössling (Ed.). *Tourism and development in tropical islands* (pp. 60–87). Northampton, MA: Edward Elgar Publishing Inc.
- Policansky, D. (2002). Catch-and-release recreational fishing: A historical perspective. In Pitcher, T. J., and C. E. Hollingworth (Eds.). *Recreational fisheries: Ecological, economic and social evaluation* (pp. 74–93). Oxford: Blackwell.
- Robbins, P. (2004). *Political Ecology: A Critical introduction*. Blackwell, Oxford.
- Rolle, C. (2014). *Personal communication*, Bonefish Folley Guiding, West End, Grand Bahama Island
- Saunders, G. (1991). Aspects of Bahamian history, loyalists, slavery and emancipation, Junkanoo. Nassau, Bahamas: Department of Archives, Ministry of Education.
- Scott, D., Gössling, S. & Hall, C. M. (2012). International tourism and climate change. *Climate Change*, 3(3), 213–232. doi:10.1002/wcc.165

- Seetanah, B. (2011). Assessing the dynamic economic impact of tourism for island economies. *Annals of Tourism Research*, 38(1), 291–308.  
doi:10.1016/j.annals.2010.08.009
- Sinelli, P.T. (2010). *All islands great and small: The role of Small Cay environments in indigenous settlement strategies in the Turks and Caicos Islands*. PhD. dissertation. Department of Anthropology, University of Florida, Gainesville, Florida.
- Smith, P. (2013). *Personal communication*. Bahamas Fly Fishing Industry Association, www.bffia.org. accessed Sept. 2013
- Strachan, I. G. (2002). *Paradise and Plantation: Tourism and Culture in the Anglophone Caribbean* (p. 317). Charlottesville,: University of Virginia Press.
- Stonich, S. C. (1998). Political ecology of tourism. *Annals of Tourism Research*, 25(1), 25–54.
- Tate, S. (2014). *Personal communication*, Deep Water Cay, Grand Bahamas Island.
- The Heritage Foundation (2013). *2014 Index of economic freedom*. Retrieved from <http://www.heritage.org/index/country/bahamas>. accessed June, 2013
- Vletas, S. & Vletas, K. (1999). *Fly fishing the Bahamas*. New York, NY: The Lyons Press.
- Wall, G. & Matheson, A. (2006). *Tourism - Change, impacts and opportunities*. Essex. UK: Prentice Pearson Hall Pub.
- Weaver, D., & Lawton, L. (2002). *Tourism management* (2nd edition). Milton, Queensland, Australia: John Wiley and Sons.
- World Tourism Orgnization (2006). *International trade statistics 2006*. Geneva: WTO.



## Appendix F

A co-authored chapter on limitations and impossibilities of sustainable tourism.

Published as:

Nepal, S., Verkoeyen, S., and Karrow, T. (2015) The end of sustainable tourism? Re-orienting the debate. In M. Hughes, D. Weaver and C. Pforr (Eds.) *The Practice of Sustainable Tourism*, (pp. 52-65) Routledge Publishing, New York, NY.

### **The End of Sustainable Tourism? Re-orienting the debate**

*Sanjay K. Nepal, Stephanie Verkoeyen, Tom Karrow*

#### **Introduction**

Debates around sustainable development and, by extension, sustainable tourism are not new. Tourism scholars, the likes of which include Butler and Wall, among others, have been some of the most vocal critics of sustainable tourism. However, critiques of sustainable tourism have largely avoided the broader debate beyond tourism. While there is general acknowledgement that tourism sustainability needs to be discussed in the context of global economic growth, globalization, changing governance and political regimes, the current literature on sustainable tourism has thus far avoided any exploration into this realm of discussion. Rather, much effort has gone into the separation and positioning of forms of tourism that are sustainable from those that are not; mass tourism activities have received much attention in this regard. Several scholars (see Butler 1999) critiqued that taking the focus of sustainability away from mass tourism, by presenting various forms of alternative tourism (e.g., responsible, pro-poor, or community-based tourism) does not encourage or engender sustainability principles in global tourism practices.

The last two decades have seen dramatic changes in the expansion and restructuring of the global economy. Specifically, rapid economic growth has occurred in the emerging markets of the “BRICS” nations (Brazil, Russia, India, China and South Africa). In response to this, two emerging trends in the global economy have been noted: i) fundamental changes occurring as a result of technological development; and ii) a global shift in the location of economic activities (Dicken, 2007). The rapid growth of BRICS economies and the influence this has had on changing patterns and spaces of global production and consumption has significant implications for global sustainability. The tourism industry cannot escape the simple fact that there will be more tourists in the future and, that, with longer life expectancies, many tourists will have more time to travel to exotic destinations. In this context, the repercussions of increased economic growth in areas once deemed the ‘global periphery’ is not difficult to comprehend.

In a recent book titled *Plato's Revenge*, author William Ophuls (2011) argues that sustainability is impossible given that we live on an industrial Titanic, fuelled by limitless material and a consumptive culture, rapidly depleting stocks of fossil hydrocarbons in an era of ecological scarcity, and irreplaceable biological and geological limits. Similarly, David Suzuki, a prominent environmental activist, laments that environmentalism has failed, as we fall victim to insatiable desires for material progress and industrialization driven by greater dependency and rapid extraction of non-renewable resources (Suzuki, 2012). With the rapid rise of the middle class in many developing countries, the demand for material resources will only continue to rise. Furthermore, if globalization assumptions are correct, humans will increasingly live in a world characterized by a homogenous culture with material aspirations, and the common desire to live 'the good life'. Currently humans occupy a highly unequal world, in terms of resource distribution and use. If this trend is extended to current patterns of resource consumption (e.g. water consumption), citizens of Angola and Cambodia, where per capita water consumption is 15 liters a day, would only achieve global equality if they were to consume similar amounts as average American citizens (575 liters of water daily) – almost 40 times current consumption levels. By and large, the United States is the model of progress all other countries want to emulate. This brings to light a fundamental contradiction of sustainable development – desire for equitable access to resources. Yet, resources are finite and limited in distribution.

The aim of this chapter is three fold: first, it provides a brief review of critiques of sustainable development and sustainable tourism; second, it provides a synopsis of current trends in the global economy and the environment; and third, it offers arguments in support of reorienting the debates in sustainable development to focus on redefining the concept that is inclusive of non-material systems, "localized" interpretations of sustainability, and the significance of local actors and agencies. The paper concludes that while sustainable tourism can exist in rhetoric, it is not a realistic concept in practice.

### **Critiques of 'Sustainable'**

With international tourist numbers surpassing 1 billion for the first time in 2012, and an expected annual economic contribution of over 1 trillion dollars (UNWTO, 2013), tourism is one of the world's largest industries. Despite this, the most frequently referenced sustainable development document, "Our Common Future", makes no mention of tourism – a major oversight (Wall, 1997). Since the release of the Brundtland Report, tourism has been slow to enter broader social, political and environmental discourses at the global level, remaining largely separate from global forums like the Rio+10 and Rio+20 Summits. Instances of sustainable tourism initiatives relating to poverty reduction (e.g. UNWTO ST-EP Initiative) and environmental protection (e.g. Agenda 21 for the Travel and Tourism Industry) remain largely isolated. Yet, owing to its cross-cutting nature, sustainable tourism can address a number of priority issues identified in the context of sustainable development, including issues relating to energy, water, agriculture and food security, disaster risk reduction, education, and gender equality.

Rather than the 'soft option' it was initially promoted as (Butler 1990), tourism has come to be regarded as an extractive industrial activity (McKercher, 1993), bringing issues of sustainability to the fore. Sustainability has become one of the most important issues ever faced by the industry (Garrod and Fyall, 1998), with the potential to change its very nature (Butler, 1999). Initial research on sustainable tourism centered on establishing the meaning of sustainability, and how this would translate to a tourism context. Garrod and Fyall (1998) urged that researchers move beyond defining sustainable tourism and consider the practical applications of the concept. And indeed, a review of the recent literature reveals a general acceptance of the term, as reflected by the general shift from conceptual papers on sustainable tourism in 1993 (45 percent) to empirical papers in 2007 (85 percent) (Lu and Nepal, 2009). However, it is argued here that in the decades since the coining of the term, sustainable tourism needs to be reoriented in terms of definition and scale if attempts to achieve this elusive goal are to succeed.

Sustainability faces problems of spatial scale, having largely been understood and defined relative to a destination. Yet, single sectors or regions cannot exist divorced from other sectors or environments. Conceptualizing tourism as a single sector rather than multiple sectors fails to acknowledge the inter-sectoral competition for resources (Wall, 1997; Butler, 1999). In this way, true sustainability can only be achieved at the global level; impacts occur not only in destination but also in other areas. But, is this realistic? We would argue that, rather than scale up the focus of sustainable tourism, efforts should be made to scale down, emphasizing the local. At the temporal scale, predicting the needs or wants of future generations is nigh impossible, such that the final verdict on the sustainability of an operation is unachievable across any reasonable time span. Furthermore, the focused attention on inter-generational equity fails to recognize intra-generational equity (Bramwell and Lane, 1993), as will be discussed in the following section.

Definitions of 'sustainable' have been described as complex, normative, imprecise, and non-operational (Saarinen, 2006). The 'inherent vagueness' of the term proves to be its greatest weakness (McKercher, 1993), with the explanation provided by the Bruntland Commission reads more like a slogan than a definition (Banerjee, 2003). There is no elaboration on which human needs are being met, thus creating a conceptually fuzzy picture, and opening up the possibility for conflicts of interest (Duffy, 2002). The conceptualization of objectives of development, sustainability and participation are similarly poorly articulated. What is to be sustainable? For whom, and for how long? (Lele, 1991). It is this very vagueness that has the power to attract hypocrites, resulting in 'cosmetic' environmentalism, as well as foster delusions of accomplishment (Gibson, 1991).

There is an inherent assumption that the only way to protect the environment is by putting a price on it (Beder, 1994). However, because sustainable development follows market logic and capitalist assumptions, this point becomes moot if degradation becomes more profitable, thus leading to descriptions of sustainable development as

‘squaring the circle’ (Robinson, 2004); an impossible task reconciling the opposing imperatives of economic growth and ecological sustainability. In fact, in its current conceptualization, sustainable tourism may be causing more harm than good. Wall (1997) and Butler (1990) cite several reasons to this effect, including the environmental impacts of long-distance travel to fragile, remote areas (often at critical times), the difficulty in spreading economic benefits to local communities, and the social impacts of prolonged contact and interaction.

Critics of sustainable tourism argue that the concept has largely been accepted for marketing reasons (e.g. Liu, 2003; Bramwell and Lane, 1993). Consequently, alternative tourism, eco-tourism, and other forms of sustainable tourism, have been unable to expand beyond niche markets (Honey, 1999). Poon’s new tourism (1994) argues that tourists have shifted from apathetic patrons simply seeking 3S (Sun-Sand-Sea) experiences to more educated, environmentally-aware, and experienced tourists. However, the potential for this type of ‘ecotourism’ to moderate environmental impacts associated with mass tourism destinations lies in the smaller numbers of participating tourists. Thus, the net effects of these eco-tourists are relatively small when taken in combination with traditional mass tourism. Given the relative affordability of the latter, it is unlikely this will change, especially in the face of recent economic down turns (Heinberg, 2011, Rubin, 2009; 2012). Rather than reducing tourism demand as might be expected, the UNWTO (2012) projects an increase in overall tourist numbers. Instead, changes in disposable incomes are expected to negatively affect more expensive forms of tourism, fostering a return to, or increase in mass tourism. Thus, declines in global economic prosperity will inhibit the growth of sustainable tourism beyond a niche market.

To illustrate the impossibility of sustainable tourism, it is important to consider current political, economic, environmental, and social trends across the globe. Examining these global trends allows for greater analysis of true sustainable tourism, and reveals how distant the reality of sustainable tourism may be.

### **Current Global Trends: A Synopsis**

The American Dream has long been a goal for Americans and non-Americans alike. Reaching economic prosperity has driven consumers to work, spend, and consume more; all cornerstones of capitalism. Industry globalization has emerged as a method to produce more products at lower prices, for greater consumption opportunities. This philosophy has placed increasingly heavy demands on finite global resources leading to tremendous economic inequities. Global shifts from non-capitalist forms of governance to market economies have further fueled desire for the elusive American dream. The fall of the former Soviet Union, changes in European governance and recent declarations from the Democratic Republic of China demonstrate a growing tendency towards capitalist-based economies. Governance shifts facilitate greater access to resources, and in turn, the wealth and prosperity sought by all, which will be illustrated through an examination of global consumption trends and widening income disparities.

The primary issue is not consumption itself, but rather the patterns and effects caused by the desire for greater equality by the majority of the world's population, as evidenced through resource consumption. According to the World Bank Development Indicators (2008), in 2005 the world's top quarter consumed a staggering 76.6 percent of global resources, while the bottom quarter survived on a mere 1.5 percent. Breaking this down further, we can see that the top quintile is responsible for the consumption of 45 percent of meat and fish, 58 percent of produced energy, 84 percent of paper, 74 percent of telephones, and 87 percent of vehicles; compared to the 5 percent, less than 4 percent, 1.1 percent, 1.5 percent and less than 1 percent of the bottom quintile in each respective category (UNDP, 1995). This inequality fundamentally distorts any progress towards sustainable development, threatening future development as demand of the few far exceeds supply (Smith, 2005). In their 2008 report, the United Nations drew attention to the fact that many poorer nations are striving to move from a "developing-state" to a "developed" status. If emerging nations were to follow a consumption course similar to today's developed nations, more strain will be placed on Earth's resources, eliminating any potential for sustainability. The Global Footprint Network has suggested that humanity requires 1.5 Earths to satisfy current demand, implying that it takes 18 months to replenish what humans use in only one year. Following current consumption trends, a whole second planet will be required by 2030 (GFN, 2013). Moreover, it has been estimated, that if the global population emulated current rates of consumption as that of Americans, humanity would require an additional 4.1 Earths to supply the necessary resources (De Chant, 2013).

Tourism is expected to magnify the inequity of consumption trends. Looking at water consumption as an example we see that direct tourism-related water consumption accounts for only 1 percent of global consumption, and is typically less than 5 percent of domestic consumption. Yet, this number can be substantially higher in countries, such as small island developing states (SIDS), with limited water resources and high seasonal variability (Gossling et al., 2010). In Barbados, tourism specific demands on freshwater accounted for one sixth of total demand in 1998, which is projected to increase to one third by 2016. Exacerbating this problem is an expected 20 percent decline in annual precipitation (Emmanuel and Spence, 2009). Water scarcity issues are not restricted to small islands. China, Ukraine, Thailand, Saudi Arabia, Netherlands, Egypt, South Africa, Lebanon, and Bahrain all face high to extreme water security risks, which will escalate as competition for water use increases (Scott et al., 2012).

In considering consumption patterns and the potential for sustainability, one must also take population growth into account. For millennia, global population remained relatively stable, with only minor, gradual increases. However, after the Industrial Revolution, this number increased exponentially, growing from an estimated 1 billion in 1804 to over 7 billion in 2011, with much of this growth occurring in the last four decades (USCB, 2013). Models project populations reaching 9 billion by 2046, putting further stress on already strained global resources. The majority of this population growth is expected to occur within developing countries, further compounding this problem. China, for example, currently hosts the world's largest national population – an estimated 1.3 billion – over four times the population of the United States (~300

million). In 2010, China's economy exceeded that of the United States for the first time, and continues to do so with an ever-increasing gap (Ross, 2013). The potential implications for sustainability become clear through a comparison of past and present energy consumption rates between these two countries. As of 2007, the United States recorded an average residential energy consumption of 1359 TWh, relative to China's 292 TWh average (World Resources Institute, 2013). But perhaps the clearest illustration of potential for growth comes in comparing car ownership. Currently, the United States boasts a staggering 80 cars per 100 people, to China's two cars per 100 people (World Resources Institute, 2013). In 2003, some 11,000 cars found their way onto Chinese roads every day; the equivalent of 4 million new private cars. Within the first half of the year, auto sales had increased by 80 percent, up from the 60 increase in 2002. If such growth is sustained, by 2015 the number of privately owned cars could jump to 150 million cars – 18 million more than the number found in the United States in 1999 (Worldwatch Institute, 2003). Given the magnitude of the China-United States population gap, and China's desire for greater prosperity, it is evident just how quickly consumptions rates can expect to escalate over the coming decades.

Analysis of demographics can provide further insight into future consumption patterns. BRIC nations are home to 268 million households that have incomes exceeding 10,000 USD, more than the United States and Eurozone combined, with expected consumer spending power expected to jump by 3.3 trillion USD between 2013 and 2020 (Boumphrey and Bevis, 2013). This trend reflects the rise of a new middle class; individuals with higher purchasing power to lead a comfortable life. Currently there are about 1.8 billion people (28 percent of the global population) who fall into a middle class category (Kharas and Gertz, 2010). Over the next two decades this number is expected to dramatically increase, with many of the designated 'poor class' (approximately 70 percent) transitioning to middle class territory. Kharas and Gertz (2010) estimate that by 2030, up to 5 billion people, almost two thirds of the global population, may be considered middle class, which has serious implications for resource consumption. As argued by Juliet Schor, consumerism of the middle class is defined by "an upscaling of lifestyle norms; the pervasiveness of conspicuous, status goods and of competition for acquiring them; and the growing disconnect between consumer desires and incomes" (Schor, 1999). With current consumption patterns already straining resources, it is unclear how the world will cope with this shift in demographics, to one of a more equitable approach to material progress.

Rising disposable incomes, combined with the relaxation of visa requirements, have opened travel to more consumers. Travel demands are expected to increase by up to 5 percent in 2014 (UNWTO, 2014), making the prospect of sustainable tourism even more challenging. China, Russia and India alone are recording absolute increases in outbound tourist trips of over one million in the next five years (Kaluina, 2013). In China, visas for lone travelers are not regulated or covered by current Approved Destination Status (ADS) agreements. Thus, travel remains largely limited to other Asian destinations (Andreu, 2013). As these restrictions subside, it is expected that the number of outbound trips will increase significantly, with forecasts predicting an increase of almost 47 million outbound trips over the next five years (Kaluina, 2013).

Meanwhile, it is expected that nearly 40 percent of Russians will have disposable income of over \$25,000 USD by 2017 (Kaluina, 2013), which has the potential to significantly increase the number of outbound travelers. Compounding this problem is a shift in demographics in developed nations. In the United States, the 65+ age group represented 12.4 percent of the population in 2000 (approximately one in eight Americans). By 2030, this number is expected to grow to 19 percent, which amounts to an estimated 72.1 million individuals – more than twice the number in 2000 (AOA, 2014). Adults over 55 years of age are also a significant contributor to increased tourist activity (Borja et al., 2002). Characterized by extensive experience and flexible schedules, these consumers place additional demands on tourism resources by expecting a higher level of service and shifting demand away from peak seasons.

Examination of environmental trends reveals similar negative outcomes for sustainability. Since 1751, approximately 337 billion metric tons (BMT) of carbon have been released into the atmosphere through a combination of fossil fuel consumption and the loss of carbon sinks (e.g. mangroves) (Boden et al., 2010). A staggering half of these emissions (roughly 169 BMT) have been released since the mid-1970s, which accounts for only 15 percent of the recorded timeframe. As of 2013, global CO<sub>2</sub> levels surpassed 400 ppm, and it is expected that emissions will continue to increase at a rate of 2 percent per year, with much of this increase from developing countries. Increased CO<sub>2</sub> emissions parallel increases in global temperature. According to the IPCC (2007), 11 of the 12 years between 1995 and 2006 ranked as the warmest years on record since 1850 (when formal recording began). In the past three decades, global surface temperatures have increased by 0.2 degrees per decade, a trend that is expected to continue and magnify (Hansen et al., 2006), which will have serious implications for ocean dynamics. As a result of thermal expansion, melting glaciers and reductions in the polar ice cap reduction, sea levels have risen at an average rate of 3.1 millimeters per year since 1993 (IPCC, 2007), which will have significant impacts on tourist destinations that depend on coastal environments as attractions. For example, Uyarra et al. (2005) found that 77 percent of tourists were unwilling to return to Barbados for the same price in the event of beach loss. Meanwhile, increases in oceanic temperature are leading to widespread coral bleaching and reef declines as a result of ocean acidification (Van Oppen et al., 2009). Reductions in reef health and extent directly affect the attractiveness of tourist destinations, and can lead to increased coastal erosion and storm surges, placing increasing strain on many SIDS (Ryan, 2011). Increased ocean temperatures have also been linked to increases in the frequency and intensity of major storms events. The number of category 4 and 5 hurricanes in the Atlantic and Pacific has doubled in the past three decades (Emanuel, 2005), growing from 187, between 1975 and 1989, to 269, between 1990 and 2004 (Webster et al., 2005). In the Caribbean, it is projected that increased hurricane damages, and subsequent loss of tourism revenue and infrastructure damages, will cost the region \$22 billion annually by 2050 and \$46 billion by 2100, representing 10 percent and 22 percent respectively of the current economy (Bueno et al., 2008).

Critical to this discussion is an examination of GHG emission sources. Within the last century, there has been a significant increase in global carbon emissions from fossil

fuels. Between 1900 and 2008, emissions increased by over 16 times (Boden et al., 2010). Energy supply, industry and land use change are the top three GHG contributors, accounting for 26 percent, 19 percent, and 17 percent of emissions respectively (based on 2004 emissions) (IPCC, 2007). Of particular importance to tourism, transportation accounts for 13 percent of emissions, which is unsurprising given reliance on petroleum-based fuels. Currently, tourism contributes approximately 5 percent to global CO<sub>2</sub> emissions (UNWTO et al., 2008). Of this, transportation accounts for 75 percent of the sector's emissions, half of which can be attributed to air transport (Scott et al., 2008). Among the top GHG emitters are China, the United States, the European Union, India, Russia, Japan, and Canada, which together represent 72 percent of total global CO<sub>2</sub> emissions (Boden et al., 2010). Considering the growth and population trends of China and India alone, long-term projections are not optimistic. Modeling per capita emissions for BRIC, the United States and the European Union, the International Energy Association (2007) projects significant increases in CO<sub>2</sub> production in all countries, excepting the United States, by 2030. In this scenario, CO<sub>2</sub> emission reductions are insufficient to reduce global warming and its associated environmental effects (US EIA, 2009). Emissions from tourism are expected to grow as a result of increased numbers of tourists and increased frequency of trips. According to *Tourism 2020 Vision* ([www.unwto.org](http://www.unwto.org)), long-haul tourism is projected to increase from 18 percent (1995) to 24 percent by 2020, with air traffic volume increasing an expected 4.5 percent per year, more than tripling CO<sub>2</sub> emissions (Owens et al., 2010).

Magnifying the effect of increased GHG emissions is the reduction in carbon “sinks”, largely a loss in global forest cover as a result of human expansion and development. According to the UNFAO (2005), the last millennia has seen forest area declines on every continent excepting Europe (a result of pre-1900 exploitation and forest clearing), with North and Central America experiencing net declines of approximately 500,000 hectares per year; Asian and Oceania losing approximately 250,000 and 650,000 hectares per year respectively; and South America and Africa exceeding losses of 4 million hectares per year. Global estimates indicate deforestation accounts for 5 BMT of CO<sub>2</sub> emissions, which amounts to approximately 16 percent of emissions from fossil fuel sources (Houghton, 2008).

## **Reorienting the Debate**

As evidenced by emerging markets, economic growth will likely fuel increased demand for resources in the developing world, ultimately leading to global equality in material progress. Thus, there is urgent need to reorient the focus of sustainable development. By implication, increased growth in global tourism and its consequences for society, the economy and the environment need to be discussed and debated in the changing context of sustainable development. We will briefly highlight four main points: 1) development needs to be redefined beyond its materialistic interpretations; 2) non-material systems and ideas need to be mainstreamed (e.g. concepts of well-being,



happiness, and quality of life); 3) the focus of sustainability needs to be scaled down from global sustainability, which is not only impractical, but also impossible, to local and community sustainability; and 4) renewed interests need to be focused on grassroots development and activism.

Several prominent scholars have argued that development discourse needs to move beyond its materialistic aspirations to include holistic interpretations. Ophuls (2011) argues that it is absolutely critical to cut down the scale, simplify the means, and limit the speed of civilization, with the aim of making it more sane and humane. Meanwhile, in his book, *Development as Freedom*, Sen (1999) argues that economic development entails a set of linked freedoms: political freedom, freedom of opportunity, and economic freedom (i.e. protection from abject poverty). In the context of sustainable tourism this means identifying the linkages between socially just forms of tourism, which have human empowerment as their core principle with opportunities to engage in locally meaningful, productive, and ecologically sustainable activities associated with tourism and development in general. In doing so, we should strive to identify the poorest segments of society (e.g. pro-poor tourism strategies). Increased emphasis must be placed on mainstreaming ideas of non-material progress into development policies, for example, looking beyond purely economic measures to incorporating human development values (e.g. well-being, happiness, quality of life). In the context of sustainable tourism, this means development that is based on local aspirations and incorporating local perspectives and world-views. A key challenge that sustainability proponents have faced to date is the impracticality of achieving ultimate global sustainability. In its current form, the idea of sustainability appears to be imposed from a higher, often external authority (e.g. the World Bank). The challenge arises making global concepts locally viable and attainable, such that they can be embraced internally and not imposed externally. It is difficult to find successful examples of sustainable tourism at a global scale, but examples do exist locally that may be deemed successful. It is not difficult to conceive how even ecotourism can be deemed a failure when analyzed at the global scale. As such, we argue that such analysis should be restricted to local or national scales. If every community were to strive for sustainability at this scale the aggregation of their successes would represent a significant global force. However, for this to happen, emphasis must be placed on grassroots development and activism, as opposed to development from above. Communities are more likely to be interested if a direct link can be shown between this type of development and the consequences of such actions. In a tourism context, if local communities organized themselves to voice their preferences and support for specific types of tourism development – that which considers local economy, culture, environment, and community relationships – and actively promoted these ideas to the agencies responsible for project implementation, prospects of sustainable tourism are possible.

## **Conclusion**

Given current patterns of economic growth and environmental degradation, hopes of ever achieving sustainability becomes a distant thought. With the spread of capitalism across the globe, epitomized by the emerging BRICS markets, the environment will

continue to degrade in the face of future global population projections and an insatiable desire for ever more resources. In this context, sustainable tourism becomes an impossible task.

Even where achieving sustainability is possible, challenges abound. Social justice demands that resources be equitably distributed. However, in bridging this gap, resources have to come from somewhere – either from those benefiting from current inequitable distribution, or through exploration of new resources. The problem becomes even more complex when considering inter-generational equity. At the heart of this debate is the contradictory duality of environmental protection coupled with economic progress. If current global trends are any indication, it would seem that when the former impedes the latter, thoughts of conservation go out the window.

Reorienting the debate requires a redefinition of development beyond its materialistic interpretations, actions at the grassroots level, and focus on what is achievable at the small-scale (i.e. developing more practical, less complex systems). A hard look in the mirror is necessary as well. It would seem hypocritical to extol the virtues of sustainability, while not putting these thoughts into action. As we have argued here, it is from this micro-scale that such initiatives must arise if we are to have any hope of achieving sustainability heading into the coming decades.

## References

- Administration on Aging (AOA). (2014). <http://www.aoa.gov> [Accessed: March, 2014].
- Andreu, R., Claver, E., & Quer, D. (2013). Chinese outbound tourism: new challenges for European tourism. *Enlightening Tourism: A Pathmaking Journal*, 3(1), 44-58.
- Banerjee, S. B. (2003). Who sustains whose development? Sustainable development and the reinvention of nature. *Organization Studies*, 24(1), 143-180.
- Beder, S. (1994) Revoltin' developments: The politics of sustainable development. *Arena Magazine*. June/July: 37-39.
- Boden, T.A., G. Marland, and R.J. Andres. 2010. Global, Regional, and National Fossil-Fuel CO<sub>2</sub> Emissions. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A.
- Borja, L.; Casanovas, J.A. & Bosch, A. (2002). *El Consumidor turístico*. Pozuelo de Alarcón, Madrid: ESIC.
- Boumphrey, S. and Bevis, E. (2013). Reaching the Emerging Middle Classes beyond BRIC. Euromonitor International.

- Bramwell, B., & Lane, B. (1993). Sustainable tourism: An evolving global approach. *Journal of Sustainable Tourism*, 1(1), 1-5.
- Bueno, R., Herzfeld, C., Stanton, E.A., and Ackerman, F. (2008). The Caribbean and Climate Change, The Costs of Inaction. Stockholm Environment Institute – US Center Global Development and Environment Institute, Tufts, university. May 2008.
- Butler, R. W. (1990). Alternative tourism: pious hope or Trojan horse?. *World Leisure & Recreation*, 31(4), 9-17.
- Butler, R. W. (1999). Sustainable tourism: A state-of-the-art review. *Tourism Geographies*, 1(1), 7-25.
- De Chant, T. (2013). [www.persquaremile.com](http://www.persquaremile.com) [Accessed: March, 2014].
- Dicken, P. (2007). Mapping the Changing Contours of the World Economy. Guilford Press. 599pgs.
- Duffy, R. (2002). *A Trip too Far: Ecotourism, Politics and Exploitation*. London: Earthscan.
- Emmanuel, K. (2005). Increasing Destructiveness of Tropical Cyclones over the Past 30 Years. *Nature*. 436: 686–88.
- Emmanuel, K. and Spence, B. (2009). Climate Change Implications for Water Resource Management in Barbados Tourism. *Worldwide Hospitality and Tourism Themes*, 1(3): 252-268.
- Garrod, B., & Fyall, A. (1998). Beyond the rhetoric of sustainable tourism?. *Tourism management*, 19(3), 199-212.
- Gibson, R., 1991. Should environmentalists pursue sustainable development? Probe Post, 22– 25.
- Global Footprint Network (GFN). (2013). <http://www.footprintnetwork.org> [Accessed: March, 2014].
- Gössling, S., Garrod, B., Aall, C., Hille, J., & Peeters, P. (2011). Food management in tourism: Reducing tourism's carbon 'foodprint'. *Tourism Management*, 32(3), 534-543.
- Honey, M. (1999) *Ecotourism and Sustainable Development: Who Owns Paradise?* Washington, DC: Island Press.
- Hansen, J., Sato, M., Ruedy, R., Lo, K., Lea, D.W., and Medina-Elizade, M. (2006). Global Temperature Change. Proceedings of the National Academy of Sciences of the United States of America. (PNAS) Vol. 103, No. 39. Pp. 14288-14293.

- Heinberg, R. (2011) *The End of Growth*. New Society Publishers. Gabriola Island, British Columbia, Canada. 320 pgs.
- Houghton, R.A. (2008) *Carbon Flux to the Atmosphere from Land-Use Changes*. 1850-2005. The Woods Hole Research Center, Massachusetts, USA.
- Intergovernmental Panel on Climate Change (IPCC). (2007). *IPCC Fourth assessment Report: Climate Change 2007*.
- Kaluina, M. (2013). *Forecast Revisit for the Global Travel and Tourism Industry*. Euromonitor International. WTM Vision 2013. Moscow.
- Kharas, H., & Gertz, G. (2010). *The new global middle class: a cross-over from West to East. China's emerging middle class: beyond economic transformation*, Brookings Institution Press, Washington, DC.
- Lele, S. M. (1991). Sustainable development: A critical review. *World development*, 19(6), 607-621.
- Liu, Z. (2003). Sustainable tourism development: A critique. *Journal of sustainable tourism*, 11(6), 459-475.
- Lu, J., & Nepal, S. K. (2009). Sustainable tourism research: an analysis of papers published in the Journal of Sustainable Tourism. *Journal of Sustainable Tourism*, 17(1), 5-16.
- McKercher, B. (1993). The unrecognized threat to tourism: Can tourism survive 'sustainability'? *Tourism management*, 14(2), 131-136.
- Ophuls, P. (2011). *Plato's revenge: Politics in the age of ecology*. MIT Press.
- Owen, B., Lee, D. S., & Lim, L. (2010). Flying into the future: aviation emissions scenarios to 2050. *Environmental science & technology*, 44(7), 2255-2260.
- Poon, A. (1994). The "New Tourism" Revolution. *Tourism Management*, 15(2), 91-92
- Robinson, John. (2004). Squaring the circle? Some thought on the idea of sustainable development. *Ecological Economics*, 48, 369-384.
- Ross, J. (2013, September 2). Key Trends in Globalization. [Blog Post]. Retrieved from <http://ablog.typepad.com/keytrendsinglobalisation/2013/09/china-has-overtaken-the-us.html>
- Rubin, J. (2009) *Why Your World is About to Get a Whole Lot Smaller*. Vintage, Canada, Toronto, Ontario. 332 pgs.

- Rubin, J. (2012) *The End of Growth*, Random House, Canada. Toronto, Ontario. 295 pgs.
- Ryan, Sim. (2011). *Assessing the Impacts of Sea Level Rise in the Caribbean using Geographic information Systems*. University of Waterloo, MES Thesis.
- Saarinen, J. (2006). Traditions of sustainability in tourism studies. *Annals of tourism research*, 33(4), 1121-1140.
- Sen, A. (1999). *Development as Freedom*. Oxford University Press, Oxford, U.K.
- Schor, J. (1999). The New Politics of Consumption: Why Americans want so much more than they need. *Boston Review*. Retrieved from: <http://new.bostonreview.net/BR24.3/schor.html>
- Scott, D., Amelung, B., Becken, S., Ceron, J. P., Dubois, G., Gössling, S., ... & Simpson, M. (2008). Climate change and tourism: Responding to global challenges. *World Tourism Organization, Madrid*, 230.
- Scott, D., Hall, C. M., & Gössling, S. (2012). *Tourism and climate change: Impacts, adaptation and mitigation* (Vol. 10). Routledge.
- Smith, M. H. (2005) *The natural advantage of nations: Business opportunities, innovation and governance in the 21st century*. Earthscan.
- Suzuki, David. (2012, May). The Fundamental Failure of Environmentalism. The David Suzuki Foundation. [Blog Post]. Retrieved from <http://www.davidsuzuki.org/blogs/science-matters/2012/05/the-fundamental-failure-of-environmentalism/>
- United Nations Food and Agriculture Organization (UNFAO). (2005). *Global Forest Resources Assessment 2005*. Rome: FAO. XV.
- UNWTO-UNEP. (2008) Climate change and tourism: Responding to global challenges. *World Tourism Organization, Madrid*, 230.
- United Nations World Tourism Organization. (2013). UNWTO Annual Report 2012. UNWTO, Madrid.
- United Nations World Tourism Organization (UNWTO). (2014). <http://www.unwto.org/> [Accessed: February, 2014].
- United States Census Bureau (USCB). (2013). <https://www.census.gov> [Accessed: February, 2014].

United States Energy Information Administration (US EIA) (2009). Projected--EIA, Annual Energy Outlook 2009. World Carbon Dioxide Emissions and Population by Region, Reference Case. DOE/EIA.

Uyarra, M. C., Cote, I. M., Gill, J. A., Tinch, R. R., Viner, D., & Watkinson, A. R. (2005). Island-specific preferences of tourists for environmental features: implications of climate change for tourism-dependent states. *Environmental conservation*, 32(01), 11-19.

Van Oppen, M.J.H and Lough, J. 2009 Coral Bleaching: Patterns, Processes, Causes and Consequences. *Ecological Studies*, 205, Springer-Verlag. Heidelberg, Berlin.

Wall, G. (1997). FORUM: Is Ecotourism Sustainable? *Environmental management*, 21(4), 483-491.

Webster, P. J., Holland, G. J., Curry, J. A., & Chang, H. R. (2005). Changes in tropical cyclone number, duration, and intensity in a warming environment. *Science*, 309(5742), 1844-1846.

World Bank. (2014). <http://www.worldbank.org/> [Accessed: February, 2014].

World Resources Institute. (2013) <http://www.wri.org/> [Accessed: February, 2014].

Worldwatch Institute. (2003). The State of Consumption Today. <http://www.worldwatch.org/> [Accessed: March, 2014].